

## LOS COCOS WIND PROJECT –DOMINICAN REPUBLIC



**Figure 01: Wind farm and local context /Source: EGE Haina CMD project design document**

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## **1. PROJECT INTRODUCTION**

Los Cocos Windfarm is located in the South Western region of the Dominican Republic between Juancho and Los Cocos in the province of Pedernales. The 77.2 MW windfarm was completed in two phases: 25.2 MW in 2011 and 52 MW in 2012 by project developer Empresa Generadora de Electricidad HAINA (EGE HAINA).

Wind energy is considered a low impact source of energy because it does not generate emissions, require large amounts of water during operation, nor does it produce hazardous waste. The only limitations associated with wind energy production comes with its dependence on a constant source of moving air, meaning its viability as an alternative source of energy depends on the wind turbines' location. The Pedernales peninsula was chosen specifically for its favorable wind conditions.

The project consists of 40 wind turbine generators with an installed capacity of 77MW. The National grid under the supervision of the National Interconnected Electricity system distributes the resulting electricity. The projects' replacement of fossil fuels displaces approximately 160,000 tons of CO<sub>2</sub> emissions.

## **2. PROJECT DESCRIPTION & LOCATION**

The Dominican Republic occupies the eastern side of Hispaniola, an island that is also host to Haiti on its western side. Like the rest of the Caribbean region, the undiversified energy program of the Dominican Republic relies heavily on energy derived from fossil fuels. As one of the largest nations in the region it is also highly dependent on imported crude oil. 75% of Dominican energy production comes from imported oil, and only 16% of the energy production is domestic and it consists mostly from burning firewood (7%), bagasse (4%) or hydro (3%). For the past 20 years, Dominican electricity demands have been increasing faster than the rate of production. This imbalance has been due to supply problems, poor management, and high generation costs, and rising fossil fuel costs.

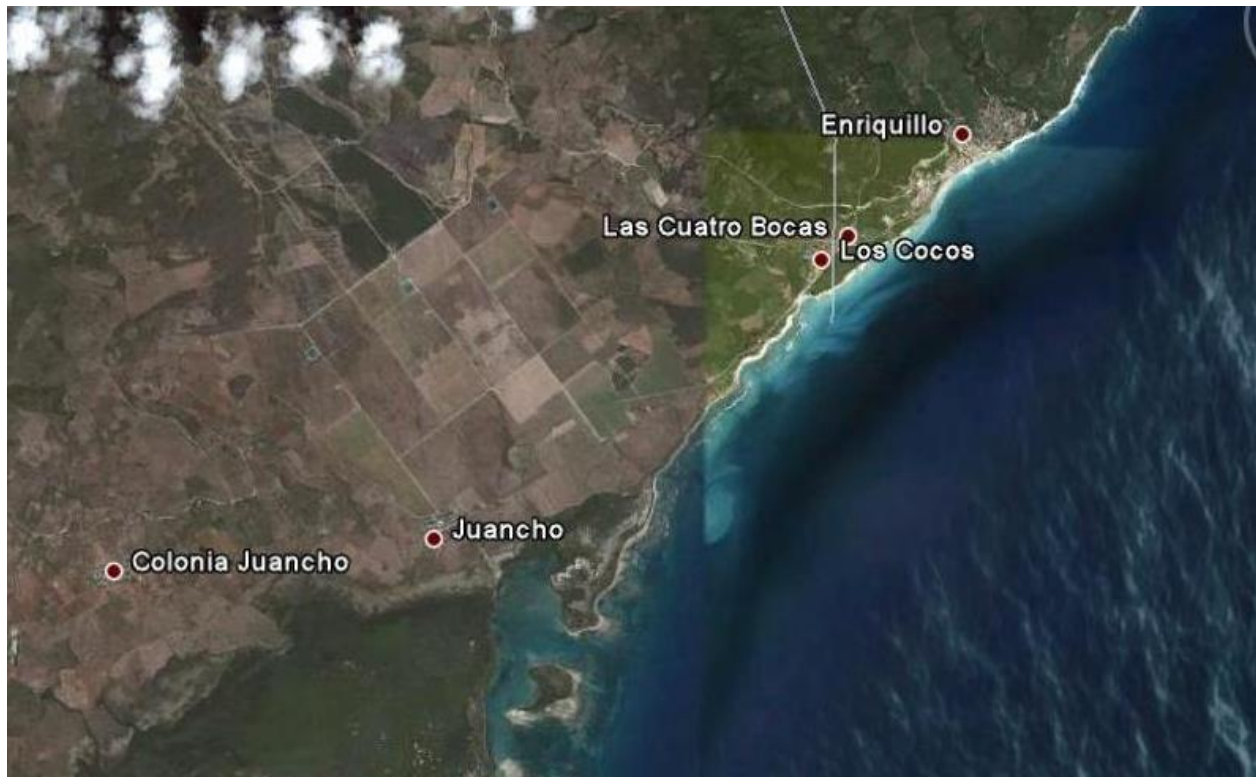
The resulting shortages have lead to several national power outages and followed by social unrest. In 2007 the Dominican Republic approved a renewable energy law giving tax exemptions to renewable energy projects in an attempt to encourage infrastructure that will lessen national dependency on fossil fuels. The National Energy Commission of the Dominican Republic (CNE) has advised that the Electricity sector combats its current crisis by reducing its generation costs and diversifying its production by seeking alternative sources of energy.

In 2004 the 11-year National Energetic Plan was released including a 10,000 MW estimation of potential wind energy. The extreme southwestern and northwestern regions were predicted to be the most effective locations for harvesting wind power due to their costal proximity and higher elevations. Pedernales ranked as one of the provinces with the best wind resources. While wind production has existed before in the Dominican Republic, it has only been used for self-generation and has not been

attached to the national grid. The Los Cocos Wind farm will be the nation's first wind energy producer connected to the national grid.

The project's construction began in March 2010 and finished in January 2013. Due to the country's need to diversify its energy matrix the Empresa Generadora de Electricidad HAINA (EGE Haina), the largest national power generation company of the SINE took on the project. In September 2008 HAINA made a partial deposit of \$14,419,599.26 USD<sup>1</sup> in order to purchase 25 2 MW capacity Vestas V90 wind turbines. The following month it signed a common land use lease with CEPM. The completed project required a budget of \$180 million USD.

The Los Cocos wind farm currently displaces an average of 160,000 tons of CO2 emissions per year and generates an annual 220,000 MWH of clean energy. The wind farm lies on an elevated ridge between 10-100 Meters above sea level, along the main road that connects Pedernales to the rest of the country. The site is in a predominantly rural area consisting mostly of irrigated farmland close to the coastal line.



Figures 02 : Project location, regional and national context /Source:EGE Haina CMD project design document

<sup>1</sup> 10,642,558.27 euros exchanged to USD at a rate of 1 US Dollar equals .74 Euro with Google Currency Converter Calculator on 12/2/2013. <http://www.google.com/search?client=safari&rls=en&q=currency+exchange&ie=UTF-8&oe=UTF-8>



Figures 03 : Project location, regional and national context /Source: EGE Haina CMD project design document

During the construction phase, EGE HAINA declared that Los Cocos would be a part of sustainable development in the Dominican Republic by:

- Strengthening self-sufficiency by taking advantages of available domestic energy resources
- Reducing the necessity of carbon emitting sources of electricity
- Supplying employment opportunities for the areas surrounding Los Cocos both during the construction and operation of the farm
- Proving an example of reliable grid connected wind energy, to be replicated in the future, thus strengthening the development potential for wind power.
- Stimulating the technological development of the Dominican Republic through the use of state-of-the-art technology to provide safe and clean electricity

### 3. APPLICATION OF THE ENVISION RATING SYSTEM<sup>2</sup>

The Envision rating system is a set of criteria that assess and evaluate any specific piece of infrastructure. In this case the infrastructure to be assessed is Los Cocos windfarm in Dominican Republic. The main intent of this rating is to evaluate the project design, construction, and operation of this project in order to provide recommendations for improvement in the future.

Envision consists of 60 credits grouped into five categories: Quality of Life, Leadership, Resource Allocation, Natural World, and Climate and Risk. Each credit pertains to a specific indicator of sustainability such as reducing energy use, preserving natural habitat, or reducing greenhouse gas emissions. Those credits are rated on a five-point scale referred to as a ‘level of achievement’: improved, enhanced, superior, conserving, and restorative. Evaluation criteria are provided to determine if the qualifications for each level of achievement has been met for a particular credit. In each of the five categories there is a specific credit called “Innovative or exceed credit requirements”. This is an open window to reward exceptional performance or the application of innovative methods.

The criteria for the levels of achievement vary from credit to credit but generally an ‘improved’ level of achievement is awarded for performance that slightly exceeds regulatory requirements. ‘Enhanced’ and ‘superior’ levels indicate gradual improvement, while ‘conserving’ often indicates performance that achieves a net-zero or neutral impact. ‘Restorative’ is the highest level and is typically reserved for projects that produce an overall positive impact for the given credit criteria. The Envision system weighs the relative value of each credit and level of achievement by assigning points. Credit criteria are documented in the Envision Guidance Manual, which is available to the public on the ISI<sup>3</sup> and Zofnass Program<sup>4</sup> websites.

Appendix C provides a table with the detailed project assessment, specifications for each of the credits, and recommendations for Los Cocos windfarm project.

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<sup>2</sup> Anthony Kane, Zofnass program research director, and Salmaan Khan, research assistant, wrote most parts of this section.

<sup>3</sup> [www.sustainableinfrastructure.org](http://www.sustainableinfrastructure.org)

<sup>4</sup> [www.zofnass.org](http://www.zofnass.org)

## 4. EVALUATION CATEGORIES

### 4.1. QUALITY OF LIFE.

The first category of *Envision* rating system is Quality of Life. The assessment here mainly refers to the impact of the project on the surrounding communities and their well-being. As stated in the *Envision* manual, “*Quality of Life particularly focuses on assessing whether infrastructure projects are in line with community goals, incorporated into existing community networks, and will benefit the community in the long term.*”<sup>5</sup> Quality of Life also determines if the project aligns with the community needs.

This category is divided into 3 subcategories and 12 credits: Purpose (QL 1.1, QL 1.2, and QL 1.3), Community (QL 2.1, QL 2.2, QL 2.3, QL 2.4, QL 2.5, and QL 2.6) and Well-Being (QL 3.1, QL 3.2, QL 3.3).

#### CREDIT SCORING

			IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE	
1	QUALITY OF LIFE	PURPOSE	QL1.1 Improve community quality of life	2	5	10	20	25
2			QL1.2 Stimulate sustainable growth and development	1	2	5	13	16
3			QL1.3 Develop local skills and capabilities	1	2	5	12	15
4	COMMUNITY		QL2.1 Enhance public health and safety	2			16	
5			QL2.2 Minimize noise and vibration	1			8	11
6			QL2.3 Minimize light pollution	1	2	4	8	11
7			QL2.4 Improve community mobility and access	1	4	7	14	
8			QL2.5 Encourage alternative modes of transportation	1	3	6	12	15
9			QL2.6 Improve site accessibility, safety and wayfinding		3	6	12	15
10	WELLBEING		QL3.1 Preserve historic and cultural resources	1		7	13	16
11			QL3.2 Preserve views and local character	1	3	6	11	14
12			QL3.3 Enhance public space	1	3	6	11	13
Maximum points possible:							<b>181</b>	

Figure 04: Quality of Life category credits distribution.

#### 4.1.1. Purpose:

Out of the possible 3 credits in the **Purpose sub-category** two credits were scored as Restorative (QL1.1 Improve Community Quality of Life, QL1.2 Stimulate Sustainable Growth & Development) Conserving (QL1.3 Develop local Skills and Capabilities).

According to the Clean Development Mechanism II summary of the environmental impact report, the project has been a source of social and economic improvement for the community. During the construction the project has led to an increase in local employment, an increase in the income levels of the community during operation of the project, and increase in the demand of goods and services during construction and operation.<sup>6</sup>

Through a \$3.2 million USD investment the company has helped rehabilitate the electrical transmission to Southern Dominican communities like Los Cocos, Juancho, Villa Esperanza, and Oviedo. The investment has allowed for the installation of a 138/12.5 kV transformer allowing the

<sup>5</sup> *Envision* Guidance Manual, p.30

<sup>6</sup> 12 *Los Cocos II CDM Project Design Document* p. 60

communities to receive continuous and reliable supply of power.<sup>7</sup> The wind farm will also power the irrigation systems of local crops.<sup>8</sup>

Los Cocos wind farm has provided employment opportunities in the project site during the assembly process and for the duration of the plant's operation. Sercitec's Environmental Impact Assessment has estimated that the construction phases have required the hire of a 150 construction crew consisting of carpenters, welders, electricians, engineers, and others. The coverage has been estimated to be local, drawing in workers from Juancho and other parts of the Pedernales province. During the operation of the project 32 people will be required distributed as follow: 5 technical employees from EGE Haina; 3 of Cobra Energy UTE Los Cocos; 24 posts to ensure the safety on site<sup>9</sup>.

EGE Haina and Los Cocos Wind Farm has maintained a close working relationship with the communities surrounding the project, collaborating with governmental and non-profit organizations to facilitate the success of the project and the development of the communities in the long term. As a result, EG Haina has initiated several initiatives that utilize the company's resources to meet community needs and to encourage sustainable economic development. These efforts have included mangroves clean-up initiatives, sustainable practice job training programs for local beekeepers and fishermen, youth and adult literacy programs, donations of supplies and electricity to local schools, sponsorship of local arts and sports, health and family planning workshops, and microfinance training sessions.

#### **4.1.2. Community:**

Out of the possible 6 credits in the **Community sub-category** one was scored as Conserving (QL2.2 Minimize Noise and Vibration), one was scored as Improved(QL2.4 Improve Community Mobility and Access), and four were scored as No Score (QL2.1 Enhance Public Health And Safety, QL2.3 Minimize Light Pollution, QL2.5 Encourage Alternative Modes of Transportation, QL2.6 Improve Site Accessibility, Safety & Wayfinding).

New technologies, materials or methodologies have the potential to pose risks to the health and safety of the communities surrounding the project. The wind farm will utilize wind turbines that will convert the kinetic energy of the wind into electrical energy. This technology has been available since the 1880's but has gained widespread interest as an alternative source of energy to fossil fuels. Wind power has only been used privately in the Dominican Republic making this a new technology for the country's public energy production. Other than the noise assessment made by GL Garrad Hassan, no documentation has been provided to indicate a full assessment of the possible risks initiated by the implementation of this technology.

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<sup>7</sup> 12 Memoria 2011 Responsabilidad Social p.8.

<sup>8</sup> Los Cocos Libro de Mesa, Capítulo IV (LCLM)

<sup>9</sup> Records of the treasury of the social security / 07-05-13 Energía y Recursos Ambientales /EGE Haina; B.O. Service & Availability Agreement/ LCII Service Availability Agreement / Thormann Peralta Security S.A. Invoice. January 2014.

The noise produced by Los Cocos was found to be within the recommended limits by the applicable international and national guidelines<sup>11</sup>, i.e. the WHO, the Normas Ambientales para la Protección Contra Ruidos, and the IFC World Bank Group EHS Guidelines, for the nearest occupied dwelling identified and considered within this study.<sup>12</sup> The project also utilized a comprehensive emergency response plan with a special category of safety protocol for spills.<sup>13</sup>

Both during the construction process and during operation the company has utilized the appropriate cautionary signage. Constructed areas are marked with signs that translate to “men at work”. Also, exterior facilities are gated with signs that read “Danger High Voltage” and “Caution.” The surrounding roads also make use of stop signs and indications of the speed limit. However no documentation has been provided to indicate appropriate emergency routes.



Figure 05: Sign reading “Caution Men at Work”  
Source: EGE Haina



Figure 06 : Sign reading “Danger: High Voltage Restricted Zone Access Prohibited”  
Source: EGE Haina



Figure 07: Sign requiring helmet, protective goggles, boots, and headphones for entry / Source: EGE Haina



Figure 08 : Sign indicating the speed limit near the site  
Source: EGE Haina

<sup>11</sup> 12 Ruido. 1012\_NIA\_EGE-Haina\_1012OR02a\_20110822\_JM, p.20

<sup>12</sup> 12 Ruido.ANEXO 3.1 INFORME CALIDAD AMBIENTAL

<sup>13</sup> 12 Programas de Manejo & Respuestas a Emergencias



No documentation has been provided to show that an overall assessment has been conducted to address the lighting needs for the project not will design of the lighting components of the project reduce or eliminate light spillage into sensitive environments and preserve the night sky.

The project team recognizes the need and utility in providing access to adjacent facilities, amenities and transportation hubs. Photo-documentation shows that before the construction the road on site was a narrow dirt path lined with trees. After construction the trees have been cleared and the road is noticeably wider and flatter allowing it to accommodate vehicles and pedestrians. The company has also repaired the road at the El Carril de Haina.<sup>14</sup>

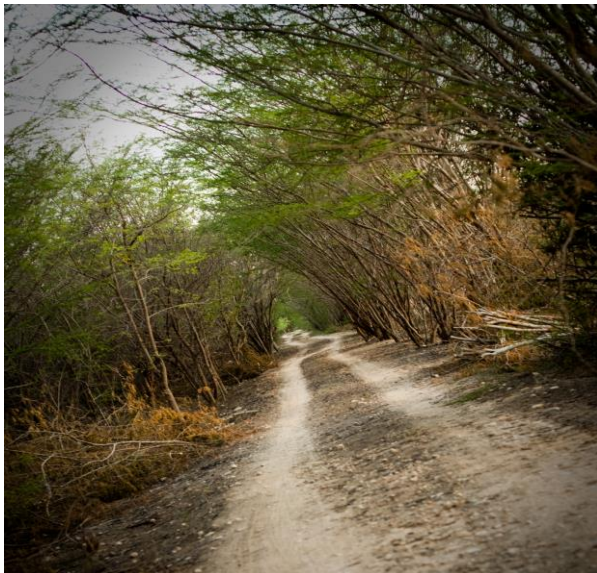


Figure 09: Before photo of the road near the site  
Source: EGE Haina



Figure 10 : After photo of the road near the site  
Source: EGE Haina



Figure 11: Photo of road near wind farm  
Source: EGE Haina



Figure 12: Photo of road near the wind farm  
Source: EGE Haina

No documentation has been provided to confirm whether the project will be within walking distance of accessible multi-modal transportation.

<sup>14</sup> 12 Memoria 2011 Responsabilidad Social, p.6,8

#### 4.1.3. Wellbeing:

Out of the possible 3 credits in the **wellbeing sub-category** one was scored as Restorative (QL3.3 Enhance Public Space), one was scored as Superior (QL3.2 Preserve Views And Local Character), and one was scored as No Score (QL3.1 Preserve Historic And Cultural Resources).

The wind turbines stand at 80 meters where there are no tall buildings, imposing noticeably on the landscape. However locals have come to consider the turbines a part of the new local character because they symbolize economic hope and have the potential to bring tourism.<sup>15</sup> EGE Hainia has also worked to enhance local character by sponsoring initiatives to clean the beaches and mangrove forests of Juancho and Enriquillo in order to promote the location as a site for ecotourism<sup>16</sup>. In August of 2012 the company sponsored the first EGE Haina MTB Competition in Juancho Los Cocos, to promote the region as a tourist destination where local artisans were allowed with opportunities to sell products<sup>17</sup>.

EGE Haina is also implementing initiatives to improve and restore existing surrounding public space that include mostly recreational spaces, beaches, and mangroves. The Wind Farm will not be in an urban/residential space thus it will not take the place of any existing public spaces. Since wind power requires open windy space it is unlikely that the farm will ever expand into an area where urban public space is affected. EGE Haina has made efforts to enhance public recreation spaces in the surrounding communities. They carried out an initiative to improve sports facilities in Juancho, by lighting up the community basketball court and playground restoration. They also repaired the community basketball courts in Juancho Colony and the softball stadium in Enriquillo, Barahona. In an effort to promote local ecotourism, the company has also carried out an initiative to clean the beaches and mangroves of Juancho and Enriquillo. Finally, the company is in the process of developing a community center that will facilitate recreational and educative activities in the areas neighboring the wind farm.<sup>18</sup>

#### 4.1.4. Innovative Credits

EGE Haina has made a priority of expanding general and environmental education among local communities. EGE Haina sponsored early childhood education center Los Farolitos, which provides tutoring to children who had no access to schooling. The staff consists of three educators who work a total of 60 hours a week with about 82 children. They have also supported Juancho Primary School's literacy program benefiting over 200 individuals in the community. They have collaborated with the Sur Futuro Foundation to train teachers and students in various subjects, emphasizing the conservation of natural resources. Additionally they are promoting the study of riparian, coastal, and lagoon water among children and adolescents through hands-on pollution studies lead by the Caribbean Student Environmental Alliance.

Through their sponsorship the Guarocuya Technical School in Enriquillo was equipped with solar panels and a small wind turbine, which allows the use of computer lab for 430 students and 16 teachers.<sup>19</sup> With the technical collaboration of World Water Relief of Atlanta they are working to install water systems in four schools in the area.<sup>20</sup> EGE Haina worked directly with Juancho Primary School to rebuild the entire septic system and all bathrooms. Collaboration with two Rotary Clubs in the United States has allowed

<sup>15</sup> 12 Memoria 2011 Responsabilidad Social p.78-79

<sup>16</sup> 12 Memoria 2011 Responsabilidad Social p 84

<sup>17</sup> 12 Memoria 2012 Social Responsibility p. 5

<sup>18</sup> 12 Los Cocos Libro de Mesa p. 83-84

<sup>19</sup> 12 Los Cocos Libro de Mesa, Capítuo IV p.75,83

<sup>20</sup> 12 Los Cocos Libro de Mesa, Capítuo IV p. 84

the company to install a new water system, build an outdoor classroom, donate 100 desks, and give Internet access to the Juancho Primary School.<sup>21</sup> EGE Haina has donated garbage cans and a drinking water system to Juancho Colony Primary School. EGE Haina has brought Internet access to Enriquillo’s Lyceum and Technical Lyceum, in addition to donating 600 backpacks for students, garbage bags and gloves.<sup>22</sup>

#### 4.1.5. Summary of results for the Quality of Life Category.

Quality of life was Los Cocos Windfarm’s best category. The table below shows the distribution of credits as well as the level of achievement reached in each credit (figure 13). For the Quality of life category Los Cocos scored 49.2% or 89 out of 181 with the greatest room for improvement in the community sub-category.

LOS COCOS WINDFARM. DOMINICAN REPUBLIC				PT.	Performance	% Total	max
1	PURPOSE	QL1.1 Improve Community Quality of Life		25	Restorative	100.0%	25
2		QL1.2 Stimulate Sustainable Growth & Development		16	Restorative	100.0%	16
3		QL1.3 Develop Local Skills And Capabilities		12	Conserving	80.0%	15
4	COMMUNITY	QL2.1 Enhance Public Health And Safety		0	No Score	0.0%	16
5		QL2.2 Minimize Noise And Vibration		8	Conserving	72.7%	11
6		QL2.3 Minimize Light Pollution		0	No Score	0.0%	11
7		QL2.4 Improve Community Mobility And Access		1	Improved	7.1%	14
8		QL2.5 Encourage Alternative Modes of Transportation		0	No Score	0.0%	15
9		QL2.6 Improve Site Accessibility, Safety & Wayfinding		0	No Score	0.0%	15
10	WELLBEING	QL3.1 Preserve Historic And Cultural Resources		0	No Score	0.0%	16
11		QL3.2 Preserve Views And Local Character		6	Superior	42.9%	14
12		QL3.3 Enhance Public Space		13	Restorative	100.0%	13
QL0.0 Innovate Or Exceed Credit Requirements				8	Innovation		
QL				89		49.2%	181

Figure 13: Summary of results in Quality of life category

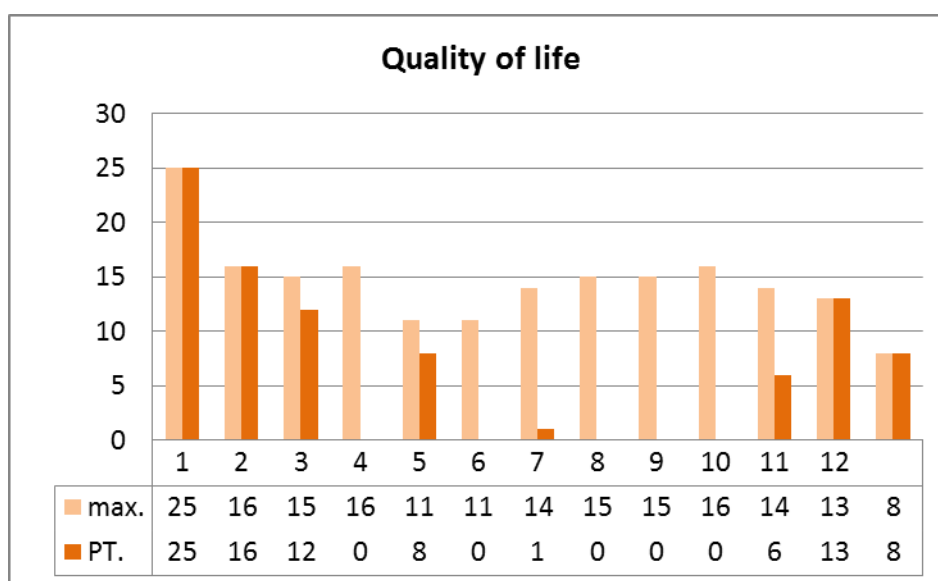


Figure 14: Summary of results in Quality of life category

<sup>21</sup> 12 Memoria 2012 Social Responsibility p.4

<sup>22</sup> 12 Memoria 2012 Social Responsibility p.4

## 4.2 LEADERSHIP

Envision’s Leadership category evaluates the collaboration, management, and planning of the project’s team, as well as its stakeholders. *Envision* states that “communicate and collaborate early on, involve a wide variety of people in creating ideas for the project, and understand the long-term, holistic view of the project and its life cycle.”<sup>23</sup> The 12 credits in this category are split into three subcategories: collaboration (LD 1.1, LD 1.2, LD 1.3, and LD 1.4), management (LD 2.1, LD 2.2) and planning (LD 3.1, LD 3.2, and LD 3.3).

### CREDIT SCORING

			IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE	
13	LEADERSHIP	COLLABORATION	LD1.1 Provide effective leadership and commitment	2	4	9	17	
14			LD1.2 Establish a sustainability management system	1	4	7	14	
15			LD1.3 Foster collaboration and teamwork	1	4	8	15	
16			LD1.4 Provide for stakeholder involvement	1	5	9	14	
17	LEADERSHIP	MANAGEMENT	LD2.1 Pursue by-product synergy opportunities	1	3	6	12	15
18			LD2.2 Improve infrastructure integration	1	3	7	13	16
19	LEADERSHIP	PLANNING	LD3.1 Plan for long-term monitoring and maintenance	1	3		10	
20			LD3.2 Address conflicting regulations and policies	1	2	4	8	
21			LD3.3 Extend useful life	1	3	6	12	
						Maximum points possible:	<b>121</b>	

Figure 15: Leadership category credits distribution.

### 4.2.1 Collaboration:

Out of the four possible credits in in the **Collaboration sub-category**, three were scored as Superior (LD1.1 Provide Effective Leadership And Commitment, LD1.2 Establish A Sustainability Management System, and LD1.4 Provide For Stakeholder Involvement) and one was scored as No Score (LD1.3 Foster Collaboration And Teamwork).

There is significant commitment and effective leadership across the organization. EGE Haina’s interest in developing a wind farm in the southern region of the Dominican Republic has been the part of a 15-year long process. In 1997 the Company began taking wind measurements in the southern provinces.<sup>24</sup> The resulting data has fueled the company’s confidence in the viability of wind production in Los Cocos despite initial technical setbacks and the shipping obstacles that emerged as a result of the 2008 oil crisis. Edgar Pichardo, President of EGE Haina has stated that the mission of the company is twofold. First, it wants to provide the nation with reliable electricity at competitive prices, through a plan of sustained investment in technology. Second, EGE Haina aspired to benefit the site of the wind farm through the preservation of the environment and development of the communities where it operates.<sup>25</sup>

The company’s private shareholders are determined to reinvest each year, in accordance with the Endowment Fund of Reformed Businesses (FONPER). In order to address the concerns of the community three stakeholders meetings were held during 2010 to get feedback from local governmental agencies,

<sup>23</sup> *Envision Guidance Manual*, p.60

<sup>24</sup> *12 Los Cocos Libro de Mesa Digital* p.61

<sup>25</sup> *12 Los Cocos Libro de Mesa Digital* p. 64

electricity sector authorities, students, general interested public, and individuals directly affected by the implementation of the project. Two meetings were held again in 2012 consultation with stakeholders. These meetings generated positive feedback for the project with suggestions that the company become involved with local development.<sup>26</sup> EGE Haina has responded by shaping an agreement with CDEEE and EDESUR to finance the adaptation of the circuits that supply the communities surrounding the park. They have sponsored several initiatives to promote ecotourism, improve local schools, and increase the skills of local workers.

There are sufficient set of business processes and management controls to address most any issue including sustainability through various monitoring programs. The Monitoring and Verification Plan will be instated to conform electricity production and emission reduction; it will be implemented over the 7-year CDM crediting periods of project activity. The project staff responsible for the maintenance of traceable and updated records will monitor electricity generation and emission reductions of the project.

The project has also adopted an environmental management and mitigation program (PMAA), which the project team will use to address any negative impacts of the project. The PMAA is a program for management of temporary facilities, activities during construction, abandonment of temporary facilities, environment, health and security, emissions and noise, fauna, social management, and for dismantling and abandonment.<sup>27</sup>

#### **4.2.2 Management:**

Out of the two possible credits in the **Management sub-category** one was scored as Restorative (LD2.2 Improve Infrastructure Integration) and one was scored as No Score (LD2.1 Pursue By-Product Synergy Opportunities).

The project takes into account the operational relationships among other elements of community infrastructure, which results in an overall improvement in infrastructure efficiency and effectiveness. The communities around Los Cocos wind farm are considered to be among the poorest in the Dominican Republic. Their remoteness from the center of production and large populations makes it difficult for them to receive electricity of good quality and voltage. As part of the project, EGE Haina constructed a high transmission line interconnecting Los Cocos with the National Grid. Together with the local electricity distribution company, EGE Haina invested in the distribution level interconnection of the community, bringing efficient electricity to thousands of families.<sup>28</sup> The plant now powers the drip irrigation system that provides water to the fields surrounding the wind farm.

While the project did not produce an assessment of the unwanted materials or byproducts produced by local facilities in order to utilize them during the construction process, Residual material from material transportation and construction were donated to the community around the wind farm. These included wood frames donated to the community for the construction of benches and tables.

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<sup>26</sup> 12 Los Cocos II CDM Project Design Document, P.59

<sup>27</sup> 12 Los Cocos I CDM Project Design Document p. 73, 77,88

<sup>28</sup> 12\_Los Cocos Libro de Mesa, p 68,85

### 4.2.3 Planning:

Out of the three possible credits in the **Planning sub-category** one was scored as Conserving (LD3.1 Plan For Long-Term Monitoring & Maintenance), one was scored Improved (LD3.3 Extend Useful Life), and one was scored as No Score (LD3.2 Address Conflicting Regulations & Policies).

Laws regulations, policies or standards of practice affecting the project are taken as a given regardless of their intended purpose or compatibility with sustainability goals and objectives. Los Cocos is a 77 MW capacity wind farm and currently the only grid-connected large-scale project to be implemented under the Law on Incentives for the Development of Renewable Energy Sources and Special Regimes, No. 57-0729 and its Implementation Regulation 30.<sup>29</sup> The project activity complies with all applicable legal and regulatory requirements under the General Electricity Law. The project organizer or team has made no effort to uncover or change existing policies that may hamper sustainable development.

As part of their inclusion as a Clean Development Mechanism, Los Cocos has a comprehensive monitoring plan to document its yearly emission reductions. It also has operation and maintenance agreements with the wind turbine suppliers to guarantee the longevity of operations.

The Monitoring and Verification Plan will be instated to conform electricity production and emission reduction, and will be implemented over the 7-year CDM crediting periods of project activity. The project staff responsible for the maintenance of traceable and updated records will monitor electricity generation and emission reductions of the project. The staff will consist of a monitoring department and a commercial department who will answer to the CDM project Coordinator. Verification of emission reductions is to be carried out annually. However monthly reports will be developed based on the monitoring data and the calculations of emission reductions. This will be done in order speed up the final verification process, and to provide a tracking of the project progress to identify any potential problem.<sup>30</sup>

The technical staff related to the operation and maintenance of Los Cocos Wind Farm will receive training consisting of a V90 course and a safety course. New employees will be trained in the specific skills required to carry out the Monitoring Plan. HAINA has subcontracted the operation and maintenance of the wind project for its first ten years to UTE Los Cocos (a subsidiary of COBRA Energy). UTE los Cocos will maintain and service Los Cocos Wind Farm in proper working order in accordance with the Mechanical Operating and Maintenance Manual, and the Electrical Operating and Maintenance Manual. The scheduled maintenance tasks are preventive measures that include service to the different components of the wind turbines such as the yaw system, gearbox, brake hydraulics, generator, lubrication unit, nacelle, meteorological equipment and electrical parts. In addition, unscheduled maintenance tasks for Los Cocos Wind Farm will be performed promptly, and when necessary, to keep and maintain the plant in good working order.<sup>31</sup>

Considerations of flexibility, durability, and resilience are minimally considered to extend the project's useful life. As part of their inclusion as a Clean Development Mechanism, Los Cocos has a comprehensive Monitoring plan to document its yearly emission reductions. The operation and maintenance agreements with the wind turbine suppliers were made to guarantee the longevity of our operations duration through the Monitoring Plan implementation. EGE Haina is investing close to \$5.0 million USD a year on

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<sup>29</sup> 12 Los Cocos II CDM Project Design Document, P.21

<sup>30</sup> 12 Los Cocos I CDM Project Design Document p 73

<sup>31</sup> 12 Los Cocos I CDM Project Design Document p.74

the operation and maintenance of the project, retaining for 10 years the international contractors of the project to ensure the project's longevity.<sup>32</sup>

#### 4.2.4 Summary of results for the Leadership category.

This category was Los Cocos Wind Farm’s second highest scoring category with each sub category having a wide scoring distribution. The table below shows the distribution of credits as well as the level of achievement reached in each credit (figure 16). The project scored 42% for the “Leadership” category or 51 out of 171.

LOS COCOS WINDFARM. DOMINICAN REPUBLIC				PT	Performance	% Total	max
13	LEADERSHIP	COLLABORATION	LD1.1 Provide Effective Leadership And Commitment	9	Superior	52.9%	17
14			LD1.2 Establish A Sustainability Management System	7	Superior	50.0%	14
15			LD1.3 Foster Collaboration And Teamwork	0	No Score	0.0%	15
16			LD1.4 Provide For Stakeholder Involvement	9	Superior	64.3%	14
17	MNGMT.		LD2.1 Pursue By-Product Synergy Opportunities	0	No Score	0.0%	15
18			LD2.2 Improve Infrastructure Integration	16	Restorative	100.0%	16
19	PLANNING		LD3.1 Plan For Long-Term Monitoring & Maintenance	10	Conserving	100.0%	10
20			LD3.2 Address Conflicting Regulations & Policies	0	No Score	0.0%	8
21			LD3.3 Extend Useful Life	1	Improved	8.3%	12
			LD0.0 Innovate Or Exceed Credit Requirements	0	N/A		
			LD	52		43.0%	121

Figure 16: Summary of results in Leadership category

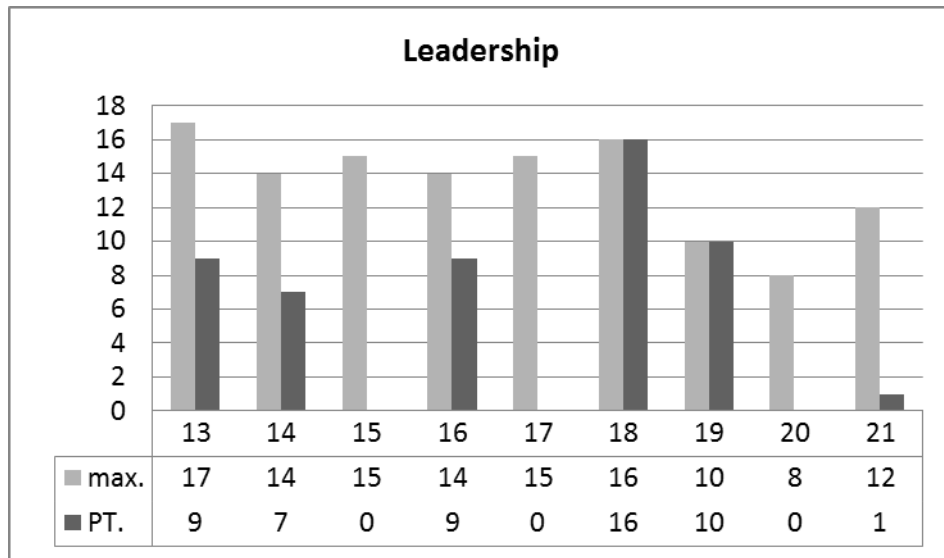


Figure 17: Summary of results in Leadership category

<sup>32</sup> 12 Los Cocos I CDM Project Design Document, pp. 73 "Description of the monitoring plan"

### 4.3 RESOURCE ALLOCATION

The Resource Allocation (RA) category deals with the quality and source of the materials used in the project during its construction and operation phases. Use and allocation of materials and other resources has a great impact on the overall sustainability of the project. The RA category is divided into 13 credits: materials (RA 1.1, RA 1.2, RA 1.3, RA 1.4, RA 1.5, RA 1.6, and RA 1.7), energy (RA 2.1, RA 2.2, and RA 2.3) and water (RA 3.1, RA 3.2, and RA 3.3).

#### CREDIT SCORING

			IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE	
22	RESOURCE ALLOCATION	MATERIALS	RA1.1 Reduce net embodied energy	2	6	12	18	
23			RA1.2 Support sustainable procurement practices	2	3	6	9	
24			RA1.3 Use recycled materials	2	5	11	14	
25			RA1.4 Use regional materials	3	6	9	10	
26			RA1.5 Divert waste from landfills	3	6	8	11	
27			RA1.6 Reduce excavated materials taken off site	2	4	5	6	
28			RA1.7 Provide for deconstruction and recycling	1	4	8	12	
29	ENERGY	RA2.1 Reduce energy consumption	3	7	12	18		
30		RA2.2 Use renewable energy	4	6	13	16	20	
31		RA2.3 Commission and monitor energy systems		3			11	
32	WATER	RA3.1 Protect fresh water availability	2	4	9	17	21	
33		RA3.2 Reduce potable water consumption	4	9	13	17	21	
34		RA3.3 Monitor water systems	1	3	6	11		
Maximum points possible:							<b>182</b>	

Figure 18: Resource Allocation category, credits distribution.

#### 4.3.1 Materials:

In the **Materials sub-category**, out of seven credits, two were scored as Superior (RA1.2 Support Sustainable Procurement Practices and RA1.4 Use Regional Materials) Two were scored Improved (RA1.5 Divert Waste From Landfills and RA1.7 Provide for Deconstruction & Recycling) and three were scored as No Score (RA1.1 Reduce Net Embodied Energy, RA1.3 Used Recycled Materials, and RA1.6 Reduce Excavated Materials Taken Off Site)



Figures 19, 20, 21: Reuse of scrap wood / Source: Source: EGE Haina



No data has been provided to confirm the conduction of an embodied energy assessment of materials, nor will the project achieve a reduction of net embodied energy over its lifetime. No documentation has been provided to confirm both the utilization of recycled materials in the construction process and the re-use of excavated material in road conditioning.

10% of the project's total materials were sourced locally with 90% of civil construction materials coming from local suppliers or sources. For instance, the silty, clayey, sandy gravel used as concrete aggregates originate from El Arroyo Mine.<sup>33</sup> Metal rebar came from Dominican supplier METALDOM.<sup>34</sup> The Gamesa Corporación Tecnológica, a Spanish corporation that specializes in the production of wind turbines and wind farms, manufactured the 26 Turbines of the second phase.<sup>35</sup> While the project did not include a policy of sourcing equipment from sustainable suppliers, Gamesa operates under a sustainability strategy that seeks to create a model of ethical business practices that will lower its carbon footprint, encourage corporate responsibility, and help the communities where projects are developed. The company's efforts have gained international recognition for its sustainable practices.<sup>36</sup>

While most of the project's construction waste has been directed to a municipal landfill, the project has adopted an Environmental Mitigation and Management Program where the recovery of scrap material is encouraged.<sup>37</sup> Scrap wood from the construction phase of the project was donated to various entities: the Juancho neighborhood beautification board to repair its enramada, to Juancho Colony to build a restaurant, to Enriquillo for the construction of a restaurant, and to Juancho Colony's Maternity center for the construction of tables and benches.<sup>38</sup>

Though not highly detailed, the chapter covering disassembly in the Environmental Mitigation and Management Program requires the cover of leftover materials with waterproof tarps to protect from water and soil. Additionally, the entire disassembly process is to be documented in an environmental report that will be submitted to the environmental authorities.<sup>39</sup>

#### 4.3.2 Energy:

In the **Energy sub-category**, one out of three credits was scored as Restorative (RA2.2 Reduce Pesticide and Fertilizer Impacts), one was scored as Conserving (RA2.3 Commission & Monitor Energy Systems), and one was declared No Score (RA2.1 Reduce Energy Consumption).

Los Cocos wind farm is a project that will supply renewable energy to the national power grid. Wind energy does not produce any emissions since the electricity is generated from the wind's kinetic energy. Los Cocos wind farm is expected to produce 157,189 sellable MWh/year.<sup>40</sup> The resulting

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<sup>33</sup> 03 Informe segunda quincena de Febrero del 2012 Ampliación Los Cocos pages 37-105,

<sup>34</sup> 06 Informe Primera Quincena Abril del 2012 Ampliación Los Cocos page 6

<sup>35</sup> 12 Los Cocos II CDM Project Design Document

<sup>36</sup> page 37, Gamesa 2012 resumen informe sostenibilidad page 39,

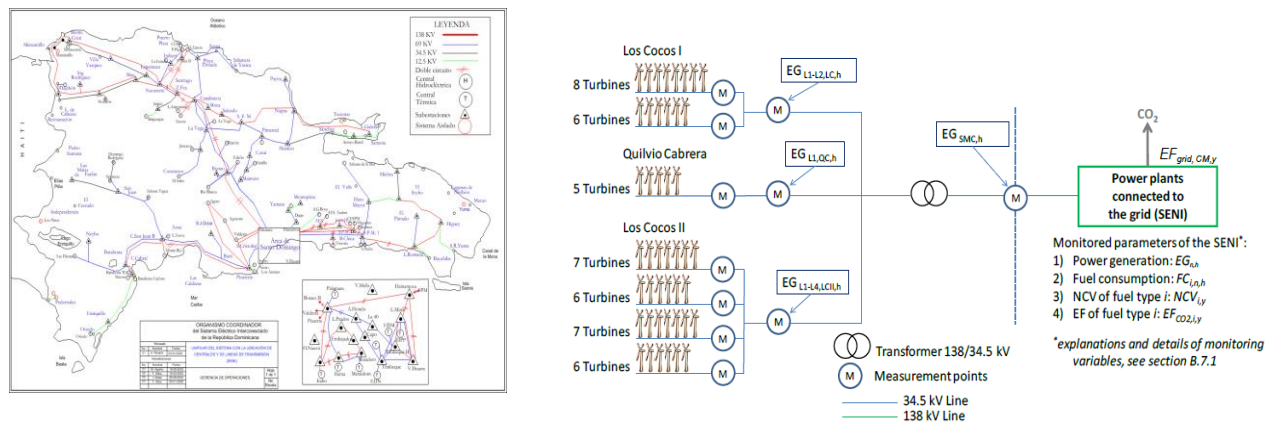
<sup>37</sup> Declaración de Impacto Ambiental Los Cocos pages 110-110

<sup>38</sup> Nov 2012 Los Cocos Community Development Memo, 12

<sup>39</sup> 12\_Declaración de Impacto Ambiental Los Cocos

<sup>40</sup> 12 Los Cocos II CDM Project Design Document page 1

electricity will displace energy based on fossil fuels that would have generated 112,489 tons of CO<sub>2</sub> emissions.<sup>41</sup>



Figures 22 and 23: Locations of monitoring system /Source: Second CDM report, p. 12

During the construction of the wind farm, the required use of machinery and equipment contributed in carbon and nitrogen emissions, but this impact was considered local and of medium magnitude.<sup>42</sup> Since the end of construction, the project has been consuming a negligible amount of its own energy (2.97%).<sup>43</sup>

The design, engineering, supply, transportation, installation, testing and completion of the wind farm will be conducted by COBRA Energy, a company chosen for its depth of experience in the construction and operation of wind farms. COBRA will operate the wind farm under a ten year O&M agreement, during which the wind farm operators will work side by side with COBRA's engineers, in order to enable them to transfer knowledge to the EGE HAINA's staff.

All operation and management staff will go through a comprehensive training program before they start working and a maintenance system has been set in place to monitor the plant's electrical production. A computer system will continuously record, monitor and integrate the data, on a 15-minute interval. The Regulatory Office of the company headquarters in Santo Domingo will maintain this data.<sup>44</sup> In addition, the Monitoring Plan will be implemented over 7-year crediting periods of the project. All data and evidence collected as part of monitoring will be archived electronically and be kept for at least for 2 years after the end of the last crediting period.<sup>45</sup>

<sup>41</sup> 12 Los Cocos II CDM Project Design Document page 23  
<sup>42</sup> 12\_Declaración de Impacto Ambiental Los Cocos page 82  
<sup>43</sup> 12Los Cocos II CDM Project Design Document II page 23  
<sup>44</sup> 12 Los Cocos II CDM Project Design Document page 56  
<sup>45</sup> 12 Los Cocos II CDM Project Design Document page 58

### 4.3.3 Water:

In the **Water subcategory**, all three credits were scored as No Score (RA3.1 Protect Fresh Water Availability, RA3.2 Reduce Potable Water Consumption, and RA3.3 Monitor Water Systems)

The construction process will result in soil erosion, which will contribute to water pollution via runoff. Since this will only happen during the construction phase, the magnitude will decrease over time and the significance of the impact has been judged to be moderate. No additional documentation has been provided to explain any measures to mitigate the pollution caused by soil erosion during the construction process.

The project has also adopted an Environmental Mitigation and Management Program, which requires that containers used for the storage of waste have fitted caps that prevent garbage from overflowing, rainwater from entering, and the sun from accelerating the decomposition of waste.<sup>46</sup> No documentation was provided to show comprehensive assessment of the project's long-term impacts on water availability. Nor is there any confirmation that the project will limit itself to the use of water that can be replenished in both quality and quantity. No documentation has been provided to confirm the conduction of feasibility and cost analyses to determine the most effective methods for potable water use reduction and incorporate them into the design, nor will the project reduce potable water consumption. Nor has there been any documentation confirming the execution of an independent monitoring of the project's water systems in order to validate the design objectives. No documents of the project include means to monitor water performance during operations or integrate long-term operations monitoring to mitigate or address leaks and improve efficiency.

### 4.3.4 Summary of results for the Resource Allocation category.

The table below (figure 24) shows the distribution of credits, as well as the level of performance achieved in each credit.

LOS COCOS WINDFARM. DOMINICAN REPUBLIC				PT.	Performance	% Total	max.
22	RESOURCE ALLOCATION	MATERIALS	RA1.1 Reduce Net Embodied Energy	0	No Score	0.0%	18
23			RA1.2 Support Sustainable Procurement Practices	6	Superior	66.7%	9
24			RA1.3 Used Recycled Materials	0	No Score	0.0%	14
25			RA1.4 Use Regional Materials	9	Superior	90.0%	10
26			RA1.5 Divert Waste From Landfills	3	Improved	27.3%	11
27			RA1.6 Reduce Excavated Materials Taken Off Site	0	No Score	0.0%	6
28			RA1.7 Provide for Deconstruction & Recycling	1	Improved	8.3%	12
29		ENERGY	RA2.1 Reduce Energy Consumption	0	No Score	0.0%	18
30			RA2.2 Reduce Pesticide and Fertilizer Impacts	20	Restorative	100.0%	20
31			RA2.3 Commission & Monitor Energy Systems	11	Conserving	100.0%	11
32	WATER	RA3.1 Protect Fresh Water Availability	0	No Score	0.0%	21	
33		RA3.2 Reduce Potable Water Consumption	0	No Score	0.0%	21	
34		RA3.3 Monitor Water Systems	0	No Score	0.0%	11	
		RA0.0 Innovate Or Exceed Credit Requirements	0	N/A			
		<b>RA</b>	<b>50</b>		<b>27.5%</b>	<b>182</b>	

Figure 24: Summary of results in Resource Allocation category

<sup>46</sup> 12\_Declaración de Impacto Ambiental Los Cocos pages 83-111

The areas with the most room for improvement are Water and Materials. The project achieved an overall score of 26.9 % or 49 out of 182.

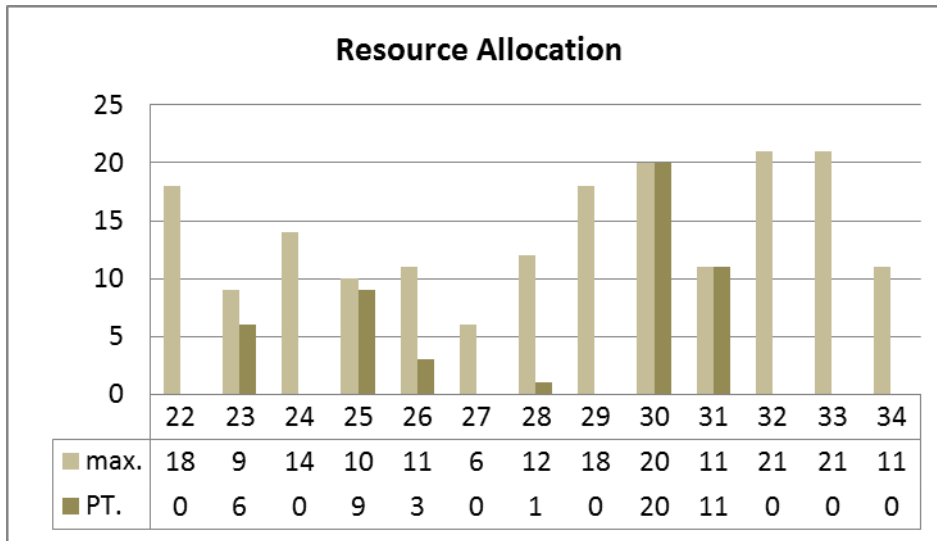


Figure 25: Summary of results in Resource Allocation category

#### 4.4 NATURAL WORLD

The Natural World category addresses “how to understand and minimize negative impacts while considering ways in which the infrastructure can interact with natural systems in a synergistic, positive way.”<sup>47</sup> The NW category is divided into 14 credits related to project siting (NW 1.1, NW 1.2, NW 1.3, NW 1.4, NW 1.5, NW 1.6, and NW 1.7), impacts to land and water (NW 2.1, NW 2.2, NW 2.3) and biodiversity (NW 3.1, NW 3.2, NW 3.3, NW 3.4).

#### CREDIT SCORING

			IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE	
35	NATURAL WORLD	SITING	NW1.1 Preserve prime habitat			9	14	18
36			NW1.2 Protect wetlands and surface water	1	4	9	14	18
37			NW1.3 Preserve prime farmland			6	12	15
38			NW1.4 Avoid adverse geology	1	2	3	5	
39			NW1.5 Preserve floodplain functions	2	5	8	14	
40			NW1.6 Avoid unsuitable development on steep slopes	1		4	6	
41			NW1.7 Preserve greenfields	3	6	10	15	23
42	NATURAL WORLD	LAND & WATER	NW2.1 Manage stormwater		4	9	17	21
43			NW2.2 Reduce pesticide and fertilizer impacts	1	2	5	9	
44			NW2.3 Prevent surface and groundwater contamination	1	4	9	14	18
45	NATURAL WORLD	BIODIVERSITY	NW3.1 Preserve species biodiversity	2			13	16
46			NW3.2 Control invasive species			5	9	11
47			NW3.3 Restore disturbed soils				8	10
48			NW3.4 Maintain wetland and surface water functions	3	6	9	15	19
Maximum points possible:							<b>203</b>	

Figure 26: Natural World credit distribution

<sup>47</sup> Envision Guidance Manual, p.116

#### 4.4.1 Siting:

Out of the total seven credits, the **siting sub-category** had two credits rated as Conserving (NW1.4 Avoid Adverse Geology and NW1.6 Avoid Unsuitable Development on Steep Slopes). One rated as Superior (NW1.1 Preserve Prime Habitat), two rated as Improved (NW1.2 Preserve Wetlands and Surface Water and NW1.5 Preserve Floodplain Functions), and two rated as No Score (NW1.3 Preserve Prime Farmland and NW1.7 Preserve Greenfields).

The project site is on an elevated ridge that consists of low-lying shrubs and farmland, and avoids any contact with local wetlands<sup>48</sup> or any development on local floodplains.<sup>49</sup> The project was constructed on a greenfield site that has not been deemed as prime habitat<sup>50</sup> or prime farmland.<sup>51</sup> The wind farm rests on a relatively flat area with a liquefaction potential of zero.<sup>52</sup> It slopes southward at 1.5%, increasing in elevation from 3.048 to 10.668 meters above sea level.<sup>53</sup>

The project site is free of sinkholes and karst, though there is one located offsite in Charco Colorado characterized by limestone Karst dissolution.<sup>54</sup> The closest fault line is about 15 km from the site. The site will not infringe upon the groundwater level nor will it produce a significant alteration to local drainage patterns.<sup>55</sup> The soils in the area are highly porous and will allow for easy permeability during periods of heavy rain. A study conducted states that the project also overlaps with the water table, but any seepage from above is either blocked or slowed down by a clay layer underlying the topsoils.<sup>56</sup>

No documentation has been provided confirming the establishment or maintenance of vegetation and soil protection zones (VSPV) around all wetlands, shorelines, and water bodies. Nor has any confirmation been provided on the creation of a habitat buffer zone or soil protection zone around the project site. Existing degraded buffer zones will not be restored to their natural state.



Figure 27: photo of project showing site and surroundings / Source: EGE Haina

<sup>48</sup> *Energy Production Assessment of Juancho Los Cocos p. 116*

<sup>49</sup> *Energy production assessment of the Juancho Los Cocos page 116*

<sup>50</sup> *12 DIA-PMAA Parque Eólico Los Cocos.pdf Section 3.2.2: and Section 4.3.4.9*

<sup>51</sup> *12 DIA-PMAA Parque Eólico Los Cocos.pdf pages 21,27, 28*

<sup>52</sup> *12 Informe Final Geotecnico Parque Eolico Los Cocos General page 59*

<sup>53</sup> *12 Estudio Geotecnico Parque Eolico Juancho-Los Cocos page 45*

<sup>54</sup> *12 Estudio Geotecnico Parque Eolico Juancho-Los Cocos pages 30-51,*

<sup>55</sup> *12 DIA-PMAA Parque Eólico Los Cocos.pdf page 17*

<sup>56</sup> *12 Informe Final Geotecnico Parque Eolico Los Cocos General pages 1, 2, 3, 4*

#### 4.4.2 Land and water:

In the **land and water sub-category**, two out of three credits got Improve NW2.3 Prevent Surface and Groundwater Contamination) and the other two got No score (NW2.1 Manage Stormwater and NW2.2 Reduce Pesticides and Fertilizer Impact).

The project has a detailed Spill Prevention Plan primarily based on precautionary measures.<sup>57</sup> A spill team will be responsible for regularly circulating and inspecting the locations of spills, investigating potential spills, and monitoring the integrity of the pipe systems. The guidelines require proper sealing of containers containing caustic or oily materials, clutter prevention, and a detailed protocol for the disposal of empty containers. Shower and eyewash stations must be made available to the staff in order to prevent the effects of on-site leaks on health.<sup>58</sup>

The project will not conduct nor acquire hydrological delineation studies, it has neither lead to an improvement in water storage capacity, nor has it been designed to restore stormwater runoff. However the completed project will not produce a significant alteration to local drainage patterns.<sup>59</sup>

No documentation has been provided to confirm whether the project will implement policies to control and reduce the application of fertilizers, if it will reserve appropriated landscaping plants to minimize the use of pesticides and fertilizers, nor if fertilizers and pesticides will be chosen based on low toxicity.

#### 4.4.3 Biodiversity:

In the **biodiversity sub-category** out of four credits one credit was rated as Restorative (NW3.1 Preserve Species Biodiversity) and three credits were considered No Score (NW3.2 Control Invasive Species, NW3.3 Restore Disturbed Soils, and NW3.4 Maintain Wetland and Surface Water Functions).

The project site is part of an area that is home to 50 species of birds belonging to 13 orders, and 26 family associations of birds.<sup>60</sup> Out of the 50 species only one, *Corvus palmarum*, was identified as threatened.<sup>61</sup> The most abundant bird species are the *Bubulcus ibis* and the *Tiaris olive*. Both are considered common and are not classified as rare or endangered.<sup>62</sup>

Since wind farms such as the one located in Altamont Pass, California have lead to increased bird deaths resulting from collisions with turbines. An avifaunal study has been conducted to assess the wind farm's impact on local birds. The study found that 70% of the identified bird species can fly at the height of the range of action of the wind turbines and their blades, while the remaining 30% of species are either aquatic or fly below 40 meters. The average flight altitude of local birds is 15.6 meters with a range of 1 to 60 meters. However, most birds will fly outside of the collision zone: only 5% of the bird population flies above 35 meters and below 125 meters.<sup>63</sup> It has been predicted that collision concerns will decrease

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<sup>57</sup> 12 Programa de manejo B-P06.101 Prevención de Derrames

<sup>58</sup> 12 Los Cocos II CDM Project Design Document.pdf

<sup>59</sup> 12 DIA-PMAA Parque Eólico Los Cocos.pdf Section page 17

<sup>60</sup> 12 Estudio Ornitofauna.50499 Informe Estudio Aves 090928 REV3 page 1

<sup>61</sup> 12 DIA-PMAA Parque Eólico Los Cocos page 49

<sup>62</sup> 12 DIA-PMAA Parque Eólico Los Cocos page 55

<sup>63</sup> 12 DIA-PMAA Parque Eólico Los Cocos page 49, 12

with time based on a study of a wind farm in Tjaereborg, Denmark. The study found a low risk of collision in migratory species since they tend to change their flight route 100 to 200 meters before reaching the turbine, suggesting that birds adapt to the presence of turbines by modifying their habits over time.<sup>64</sup> There is no concrete data yet that shows the flight patterns of migratory birds so it has not been confirmed where or not the turbines lie in the routes of major migratory species.<sup>65</sup>

No documentation has been provided to confirm the implementation of efforts to increase the quality or quantity of existing habitat and wildlife movement corridors. The project will not make an effort to remove invasive species for the site, nor is it implementing a comprehensive management plan to identify, control, and/or eliminate invasive species. No documentation was provided to confirm the reuse of the site’s removed soil for road conditioning.

#### 4.4.4 Summary of results, Natural World category:

The table below shows the distribution of credits, as well as the level of performance achieved in each credit.

LOS COCOS WINDFARM. DOMINICAN REPUBLIC				PT.	Performance	% Total	max
35	NATURAL WORLD	SITING	NW1.1 Preserve Prime Habitat	9	Superior	50.0%	18
36			NW1.2 Preserve Wetlands and Surface Water	1	Improved	5.6%	18
37			NW1.3 Preserve Prime Farmland	0	No Score	0.0%	15
38			NW1.4 Avoid Adverse Geology	5	Conserving	100.0%	5
39			NW1.5 Preserve Floodplain Functions	2	Improved	14.3%	14
40			NW1.6 Avoid Unsuitable Development on Steep Slopes	6	Conserving	100.0%	6
41			NW1.7 Preserve Greenfields	0	No Score	0.0%	23
42		L & W	NW2.1 Manage Stormwater	0	No Score	0.0%	21
43			NW2.2 Reduce Pesticides and Fertilizer Impacts	0	No Score	0.0%	9
44			NW2.3 Prevent Surface and Groundwater Contamination	1	Improved	5.6%	18
45		BIODIVERSITY	NW3.1 Preserve Species Biodiversity	16	Restorative	100.0%	16
46			NW3.2 Control Invasive Species	0	No Score	0.0%	11
47			NW3.3 Restore Disturbed Soils	0	No Score	0.0%	10
48			NW3.4 Maintain Wetland and Surface Water Functions	0	No Score	0.0%	19
NW0.0 Innovate or Exceed Credit Requirements				0	N/A		
NW				40		19.7%	203

Figure 28: Summary of results in Natural World category

The greatest areas of improvement can be found in the Biodiversity, and Land and Water subcategories. The project scored a 20.7% in this category or 42/203 points.

<sup>64</sup> 12 Estudio Ornitofauna.50499 Informe Estudio Aves 090928 REV3 page 16

<sup>65</sup> Estudio Ornitofauna.50499 Informe Estudio Aves 090928 REV3

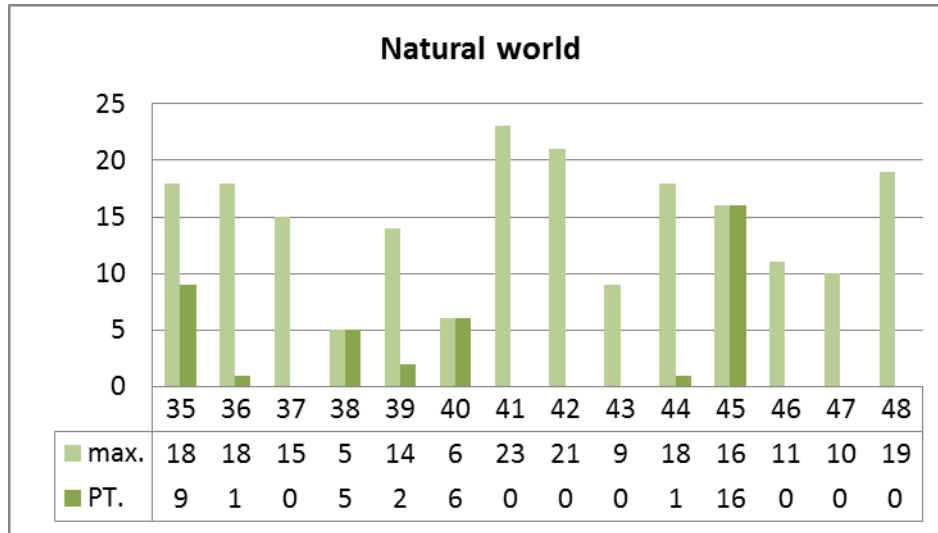


Figure 29: Summary of results in Natural World category

#### 4.5 CLIMATE AND RISK

Envision’s Climate and Risk category is divided in two main subcategories, emissions and resilience. The main goals of the category are to “minimize emissions that may contribute to increased short and long-term risks” and “to ensure infrastructure projects are resilient to short-term hazards or long-term altered future conditions.”<sup>66</sup> The credits are distributed as: Emissions (CR.1.1, CR. 1.2), and Resilience (CR.2.1, CR. 2.2, CR.2.3, CR. 2.4, CR. 2.5).

##### CREDIT SCORING

			IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE	
49	CLIMATE & RISK	EMISSIONS	CR1.1 Reduce greenhouse gas emissions	4	7	13	18	25
50		CR1.2 Reduce air pollutant emissions	2	6		12	15	
51	RESILIENCE	RESILIENCE	CR2.1 Assess climate threat				15	
52		CR2.2 Avoid traps and vulnerabilities	2	6	12	16	20	
53		CR2.3 Prepare for long-term adaptability				16	20	
54		CR2.4 Prepare for short-term hazards			10	17	21	
55		CR2.5 Manage heat islands effects	3	2	4	6		
			Maximum points possible:				<b>116</b>	

Figure 30: Climate and Risk credit distribution.

##### 4.5.1 Emissions

Out of the two credits in the **emissions sub-category** Los Cocos wind farm had one Conserving (CR1.2 Reduce Air Pollutant Emissions) score and one Superior score (CR1.2 Reduce Air Pollutant Emissions).

The project will result in a negligible or nonexistent impact on the local air quality because wind power uses the kinetic energy of wind rather than the burning of fossil fuel to generate energy.<sup>67</sup> The

<sup>66</sup> Envision Guidance Manual, p.150

<sup>67</sup> 12 Los Cocos II CDM Project Design Document.pdf page 2



wind farm does produce pollutants like sulfur dioxide, nitrogen oxides and particulate matter. The project reduces Greenhouse gas emissions because it provides clean energy through wind power. Based on projections derived from the plant activity in the year 2011, the wind farm is expected to reduce 160,000 tons of carbon emissions annually by displacing the consumption of polluting and energy sources.<sup>68</sup> The project will also result in a reduction of air pollution emissions by displacing the demand for energy derived from fossil fuels. Additionally the success of this project is on both diversifying the national energy matrix, and encouraging future attempts at building wind farms in the Dominican Republic.

Given this information the project is in the position to receive a score of conserving for the CR 1.1 credit (18 points). However this category also requires a comprehensive life cycle carbon assessment. Since no documentation has been provided to confirm or deny the execution of a life cycle GHG assessment, the project will be awarded a score of enhanced (7 points).

#### **4.5.2 Resilience**

Out of the five credits of the **resilience sub-category** two have an Improved score (CR2.2 Avoid Traps And Vulnerabilities and CR2.4 Prepare For Short-Term Hazards ), three were No Score (CR2.1 Assess Climate Threat, CR2.3 Prepare For Long-Term Adaptability, CR2.4 Prepare For Short-Term Hazards and CR2.5 Manage Heat Island Effects).

A detailed assessment of the wind capacity was conducted from 2009 to 2012, which informed the specific placement of the wind turbines.<sup>69</sup> However, the assessment was only done for a three-year period and does not necessarily take into account future changes in wind patterns that may result from climate change. The wind farm's sustainability depends largely on the persistence of wind; if winds were to strengthen or weaken to the point that they exceed or fall far below the plant's capacity, the plant would cease to be a reliable source of energy.

While a comprehensive hurricane response plan has been put in place for the project, the plan does not take into account any augmentations in magnitude and duration as a result of climate change. No additional plans have been provided that address other relevant consequences of climate change such as altered weather patterns which may result in weaker or stronger winds. Additionally, the project is not designed to accommodate a changing climatic environment throughout the project's lifespan.

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<sup>68</sup> 2 *Los Cocos II CDM Project Design Document.pdf* pages 2, 42

<sup>69</sup> 12 *Los Cocos II CDM Project Design Document.pdf* page 6

### 4.5.3 Summary of results: Climate and Risk category.

The table below shows the distribution of credits as well as the level of performance achieved in each credit:

LOS COCOS WINDFARM. DOMINICAN REPUBLIC				PT.	Performance	% Total	max.
49	EMISSION	CR1.1 Reduce Greenhouse Gas Emissions		13	Superior	52.0%	25
50		CR1.2 Reduce Air Pollutant Emissions		12	Conserving	80.0%	15
51	RESILIENCE	CR2.1 Assess Climate Threat		0	No Score	0.0%	15
52		CR2.2 Avoid Traps And Vulnerabilities		2	Improved	10.0%	20
53		CR2.3 Prepare For Long-Term Adaptability		0	No Score	0.0%	20
54		CR2.4 Prepare For Short-Term Hazards		3	Improved	14.3%	21
55		CR2.5 Manage Heat Island Effects		0	No Score	0.0%	6
CR0.0 Innovate Or Exceed Credit Requirements				0	N/A		
<b>CR</b>				<b>30</b>		<b>24.6%</b>	<b>122</b>

Figure 31: Summary of results in Climate and Risk category

Climate and Risk (CR) performed well but could have achieved almost full scores for the entire category if more documentation was given. Resilience had the most room for improvement because of the lack of investigation on how the project would be affected by climate change. The project achieved a score of 15% or 19 out of 122 points.

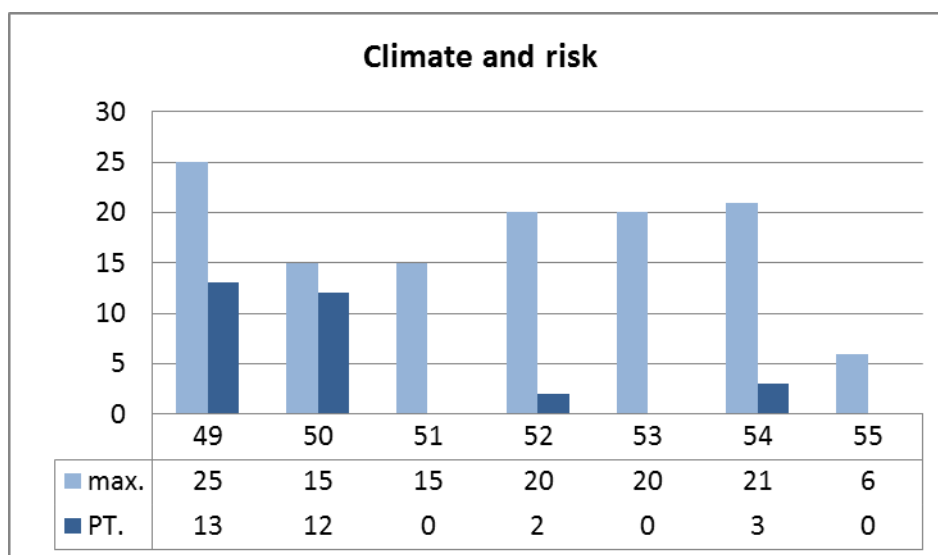


Figure 32: Summary of results in Climate and Risk category

## 5. RESULTS AND CONCLUSION

The evaluation of Los Cocos Wind Farm, the first grid-connected windfarm in Dominican Republic, shows that the project has effectively contributed to sustainable development in the Southern Dominican Republic, as well as which areas the project have room for improvement.

In the **Quality of Life** category, the project obtained 89 out of 181 points, or 49,2%. This is the best Category for Los Cocos Wind Farm. The wind farm itself is linked to a project that has brought electricity in the Southern Dominican Region. The adjacent communities will benefit not only from the increases availability of electrical power but also from the social programs, initiatives, and sponsorships provided by EGE Haina. The success of these projects will increase local economic opportunities though education; schools will be better equipped with an augmentation of supplies and the donation of technological resources, while adults will be given the opportunity to adapt their professional skills to a more sustainable and resilient model.

The project has made some effort in making sure that the project will produce low negative social impacts. They have fixed and expanded surrounding roads and kept potential noise levels at a minimum. While the finished project will be visually imposing on the landscape, EGE Haina's work within the community and the potential for economic development has allowed the community to adopt the turbines as a part of their local character. Furthermore the project team has worked to expand upon public space local character by repairing sports facilities, providing a community center, and launching an initiative to clean up local mangroves in order to encourage ecotourism. As a result of this effort in collaboration with the community, the project has gotten an innovation credit. This credit awards the expanding environmental education among local communities. EGE Haina also sponsored early childhood education center Los Farolitos, which provides tutoring to children who had no access to schooling.

**Leadership** was the second highest performing category, the project obtained 52 out of 121 points, or 43%. Los Cocos wind farm is the conclusion of a 15 yearlong project to add reliable wind power to the Dominican energy matrix. The Project is acting out in accordance to the Law on Incentives for the Development of Renewable Energy Sources and Special Regimes, No. 57-0729 and its Implementation Regulation 30.<sup>70</sup> It is also a part of an attempt to promote the sustainable economic development of its host communities, which are considered to be among poorest in the Dominican Republic. It has accomplished the latter by shaping an agreement with CDEEE and EDESUR to finance the adaptation of the circuits that supply the communities surrounding the park, with safe and reliable electricity. They have also sponsored several initiatives to promote ecotourism, improve local schools, and increase the skills of local workers.

The adoption of a thorough Monitoring and Verification Plan will provide a detailed assessment of its annual emission reductions, and an environmental management and mitigation program, which the project team will use to assess the project's impact and eventual dismantling and abandonment.<sup>71</sup> The associated staff will receive general and technical training.

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<sup>70</sup> 12 Los Cocos II CDM Project Design Document, P.21

<sup>71</sup> 12 Los Cocos I CDM Project Design Document p. 73, 77,88

The **Resource Allocation category** has the third highest performance, the project obtained 50 of 182 points, or 27.5 %. While most of the projects materials have been imported, the project teams have worked to mitigate its impact by sourcing most construction materials from local sources, obtaining the turbines from a manufacture that operates under a sustainability strategy, donating leftover project materials to local construction projects, and adopting an Environmental Mitigation and Management Program where the recovery of scrap material is, and the protection of storm water from waste, is encouraged. The program also looks to the future by requiring that the entire disassembly process be documented in an environmental report that will be submitted to the environmental authorities.<sup>72</sup>

While the construction of the wind farm required use of machinery and equipment that contributed in carbon and nitrogen emissions, this impact was considered local and of medium magnitude.<sup>73</sup> Furthermore, since the end of construction, the project has been consuming a negligible amount of its own energy (2.97%).<sup>74</sup>

The construction process will result in soil erosion, which will contribute to water pollution via runoff. As is the case with its contribution to emission this will only happen during the construction phase, the magnitude will decrease over time and the significance of the impact has been judged to be moderate.

The project will be able to improve through the help of assessments, which will allow it to gauge its impacts on local water and overall carbon footprint and to conduct monitoring operations that will improve its sustainability efforts.

In the **Natural World category**, the project obtained 40 out of 203 points, or 19.7%, making it the lowest scoring category. The wind farm is located in an area assessed as not being of high ecological value. The project site is on an elevated ridge that consists of low-lying shrubs and farmland. It avoids any contact with local wetlands,<sup>75</sup> local floodplains,<sup>76</sup> volatile sloping conditions,<sup>77</sup> and adverse geology.<sup>78</sup> The project will not produce a significant alteration to local drainage patterns.<sup>79</sup> While the project will take the place on a greenfield and farmland site that has not been deemed as prime habitat<sup>80</sup> or prime farmland.<sup>81</sup>

The thorough avifaunal investigation that has been carried out in the area, uncovered the presence of one threatened bird species,<sup>82</sup> however, the two most abundant species are common and are neither considered rare nor endangered.<sup>83</sup> The study has also concluded that the wind farm's potential negative impact through turbine collisions will be small and decrease over time.<sup>84</sup>

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<sup>72</sup> 12\_Declaración de Impacto Ambiental Los Cocos

<sup>73</sup> 12\_Declaración de Impacto Ambiental Los Cocos page 82

<sup>74</sup> 12Los Cocos II CDM Project Design Document II page 23

<sup>75</sup> Energy Production Assessment of Juancho Los Cocos p. 116

<sup>76</sup> Energy production assessment of the Juancho Los Cocos page 116

<sup>77</sup> (12 Estudio Geotecnico Parque Eolico Juancho-Los Cocos page 45

<sup>78</sup> 12 Informe Final Geotecnico Parque Eolico Los Cocos General page 59

<sup>79</sup> 12 DIA-PMAA Parque Eólico Los Cocos.pdf Section page 17

<sup>80</sup> 12 DIA-PMAA Parque Eólico Los Cocos.pdf Section 3.2.2: and Section 4.3.4.9

<sup>81</sup> 12 DIA-PMAA Parque Eólico Los Cocos.pdf pages 21,27, 28

<sup>82</sup> 12 DIA-PMAA Parque Eólico Los Cocos page 49

<sup>83</sup> 12 DIA-PMAA Parque Eólico Los Cocos page 55

<sup>84</sup> 12 Estudio Ornitofauna.50499 Informe Estudio Aves 090928 REV3 page 16

The project has a detailed Spill Prevention Plan primarily based on precautionary measures<sup>85</sup> to be executed by a spill team. Shower and eyewash stations must be made available to the staff in order to prevent the effects of on-site leaks on health.<sup>86</sup>

The project can achieve more in this category by improving or augmenting existing habitat and wildlife movement corridors, establishing vegetation and soil protection zones (VSPV) and habitat buffer zone around the project site, and by implementing policies to control and reduce the application of toxic fertilizers and pesticides. An assessment of the invasive species population would put the project in the position to implement a plan to identify, control, and/or eliminate invasive species. Hydrological delineation studies, could allow project modifications to improve in water storage capacity, and restore storm water runoff.

**Climate and Risk** obtained a score of 30 out of 122 points or 24.6 % more points. The project is projected to reduce 112,489 tons of carbon emissions annually by displacing the consumption of polluting and energy sources.<sup>87</sup> It will also result in a reduction of air pollution emissions by displacing the demand for energy derived from fossil fuels. Additionally the success of this project is on both diversifying the national energy matrix and encouraging future attempts at building wind farms in the Dominican Republic.

The placement of the farm and its turbines was informed by a detailed assessment of the wind capacity was conducted from 2009 to 2012.<sup>88</sup> A detailed response plan has been put in place for natural disasters that will likely arise within the next 25 years like hurricanes, floods, and earthquakes.

Taking into account the impact climate change will have on natural threats and in existing wind patterns, would increase the resilience of the project. A comprehensive life cycle carbon assessment would have also resulted in higher scoring in this category.

The graphs below demonstrate the project's performance under the three Infrastructure 360<sup>o</sup> Awards. The **People and Leadership Award** (figure 33) represents the QL and LD categories from the Envision™ Rating System. The project received a score of 141 points out of a total of 302 combined points within these categories, which equates to a 46.67 % level of achievement. The **Climate and Environment Award** (figure 33) represents the RA, NW and CR categories within the Envision™ Rating System. The project received a score of 120 points out of a total of 507 combined points within these categories, which equates to a 23.66 % level of achievement. Thus, the overall achievement of Los Cocos windfarm project under the **Infrastructure 360 Award** (figure 34) is 261 out of 809 points, or 32.3 % of the total score.

This report evaluates the sustainability performance of Los Cocos windfarm project according to the Envision™ Rating System. The report identifies areas in which the project scored highly, as well as low-scoring areas that represent opportunities for which the project team can learn and improve on in future projects, as they strive to achieve sustainable project design and construction methodologies.

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<sup>85</sup> 12 Programa de manejo B-P06.101 Prevención de Derrames

<sup>86</sup> 12 Los Cocos II CDM Project Design Document.pdf

<sup>87</sup> 2 Los Cocos II CDM Project Design Document.pdf pages 2, 42

<sup>88</sup> 12 Los Cocos II CDM Project Design Document.pdf page 6

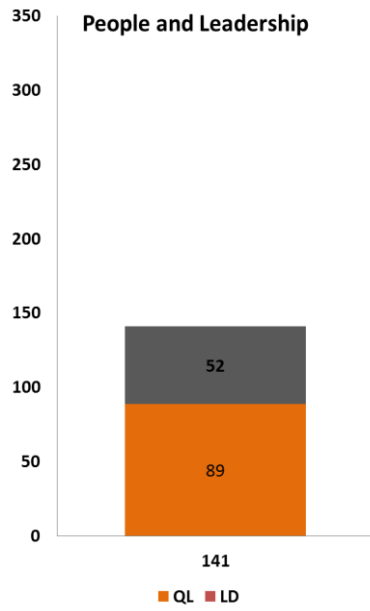


Figure 33: People and Leadership.  
Score distribution

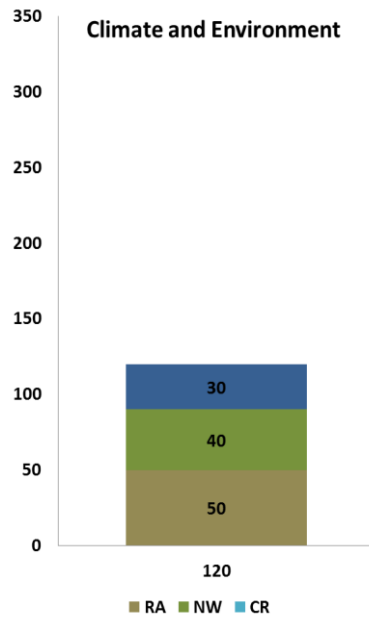


Figure 34: Climate and Environmental.  
Score distribution

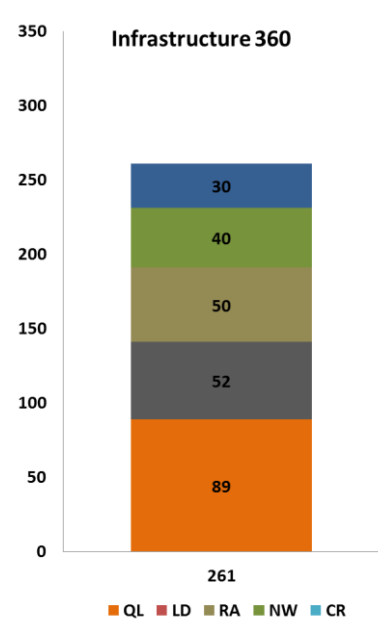


Figure 35: Infrastructure 360.  
Score distribution



**APPENDIX A: PROJECT PICTURES AND DRAWINGS**



Figure 36: General view of Los Cocos windfarm. / Source: EGE Haina



Figure 37: General view of Los Cocos windfarm. / Source: EGE Haina



Figure 38: General view of Los Cocos windfarm. / Source: EGE Haina



Figure 39: General view of Los Cocos windfarm. / Source: EGE Haina



Figure Figure 40: General view of Los Cocos windfarm. / Source: EGE Haina



Figure Figure 41: General view of Los Cocos windfarm. / Source: EGE Haina



**APPENDIX B: ENVISION POINTS TABLE**

**CREDIT SCORING**

			IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE	
1	<b>QUALITY OF LIFE</b>	<b>PURPOSE</b>	QL1.1 Improve community quality of life	2	5	10	20	25
2			QL1.2 Stimulate sustainable growth and development	1	2	5	13	16
3			QL1.3 Develop local skills and capabilities	1	2	5	12	15
4		<b>COMMUNITY</b>	QL2.1 Enhance public health and safety	2			16	
5			QL2.2 Minimize noise and vibration	1			8	11
6			QL2.3 Minimize light pollution	1	2	4	8	11
7			QL2.4 Improve community mobility and access	1	4	7	14	
8			QL2.5 Encourage alternative modes of transportation	1	3	6	12	15
9			QL2.6 Improve site accessibility, safety and wayfinding		3	6	12	15
10		<b>WELLBEING</b>	QL3.1 Preserve historic and cultural resources	1		7	13	16
11			QL3.2 Preserve views and local character	1	3	6	11	14
12			QL3.3 Enhance public space	1	3	6	11	13
			Maximum points possible:				<b>181</b>	
13	<b>LEADERSHIP</b>	<b>COLLABORATION</b>	LD1.1 Provide effective leadership and commitment	2	4	9	17	
14			LD1.2 Establish a sustainability management system	1	4	7	14	
15			LD1.3 Foster collaboration and teamwork	1	4	8	15	
16			LD1.4 Provide for stakeholder involvement	1	5	9	14	
17		<b>MANAGEMENT</b>	LD2.1 Pursue by-product synergy opportunities	1	3	6	12	15
18			LD2.2 Improve infrastructure integration	1	3	7	13	16
19		<b>PLANNING</b>	LD3.1 Plan for long-term monitoring and maintenance	1	3		10	
20			LD3.2 Address conflicting regulations and policies	1	2	4	8	
21			LD3.3 Extend useful life	1	3	6	12	
			Maximum points possible:				<b>121</b>	
22	<b>RESOURCE ALLOCATION</b>	<b>MATERIALS</b>	RA1.1 Reduce net embodied energy	2	6	12	18	
23			RA1.2 Support sustainable procurement practices	2	3	6	9	
24			RA1.3 Use recycled materials	2	5	11	14	
25			RA1.4 Use regional materials	3	6	9	10	
26			RA1.5 Divert waste from landfills	3	6	8	11	
27			RA1.6 Reduce excavated materials taken off site	2	4	5	6	
28			RA1.7 Provide for deconstruction and recycling	1	4	8	12	
29		<b>ENERGY</b>	RA2.1 Reduce energy consumption	3	7	12	18	
30			RA2.2 Use renewable energy	4	6	13	16	20
31			RA2.3 Commission and monitor energy systems		3		11	
32		<b>WATER</b>	RA3.1 Protect fresh water availability	2	4	9	17	21
33			RA3.2 Reduce potable water consumption	4	9	13	17	21
34	RA3.3 Monitor water systems		1	3	6	11		
			Maximum points possible:				<b>182</b>	
35	<b>NATURAL WORLD</b>	<b>SITING</b>	NW1.1 Preserve prime habitat			9	14	18
36			NW1.2 Protect wetlands and surface water	1	4	9	14	18
37			NW1.3 Preserve prime farmland			6	12	15
38			NW1.4 Avoid adverse geology	1	2	3	5	
39			NW1.5 Preserve floodplain functions	2	5	8	14	
40			NW1.6 Avoid unsuitable development on steep slopes	1		4	6	
41			NW1.7 Preserve greenfields	3	6	10	15	23
42		<b>LAND &amp; WATER</b>	NW2.1 Manage stormwater		4	9	17	21
43			NW2.2 Reduce pesticide and fertilizer impacts	1	2	5	9	
44			NW2.3 Prevent surface and groundwater contamination	1	4	9	14	18
45		<b>BIODIVERSITY</b>	NW3.1 Preserve species biodiversity	2			13	16
46			NW3.2 Control invasive species			5	9	11
47	NW3.3 Restore disturbed soils					8	10	
48	NW3.4 Maintain wetland and surface water functions		3	6	9	15	19	
			Maximum points possible:				<b>203</b>	
49	<b>CLIMATE &amp; RISK</b>	<b>EMISSIONS</b>	CR1.1 Reduce greenhouse gas emissions	4	7	13	18	25
50			CR1.2 Reduce air pollutant emissions	2	6		12	15
51			CR2.1 Assess climate threat				15	
52		<b>RESILIENCE</b>	CR2.2 Avoid traps and vulnerabilities	2	6	12	16	20
53			CR2.3 Prepare for long-term adaptability				16	20
54			CR2.4 Prepare for short-term hazards	3		10	17	21
55	CR2.5 Manage heat islands effects	1	2	4	6			
			Maximum points possible:				<b>116</b>	
							<b>803</b>	

\*The five innovation credits are bonus points and not included in total point tallies

**APPENDIX C: CREDIT DETAILS**

CATEGORY I, PEOPLE AND LEADERSHIP (PL)			
SUB CATEGORY: QUALITY OF LIFE			
	LOS COCOS WINDFARM. DOMINICAN REPUBLIC	RECOMMENDATIONS	
<b>PL1.1 Improve Community Quality of Life</b>	<b>25</b>	<p><b>Restorative</b></p> <p>According to the Clean Development Mechanism II summary of the environmental impact report the project has been a source of social and economic improvement for the community. During the construction, the project has led to an increase in local employment, an increase in the income levels of the community during operation of the project, and increase in the demand of goods and services during construction and operation (12 LC II CDM PDD p. 60)</p> <p>Empresa Generadora de Electricidad Haina has facilitated communication between Juancho Edesur to initiate a process of rural electrification that will allow the surrounding communities to benefit from the first power line crossing southern Dominican Republic. EGE Haina invested over a million dollars in the distribution transformer to provide energy efficiently to the neighboring population of the Juancho National Electric System. The wind farm will also power the irrigation systems of local crops. EGE Haina and Los Cocos Wind Farm has maintained a close working relationship with the communities surrounding the project, collaborating with governmental and non-profit organizations to facilitate the success of the project in the long term. As a result, EG Haina has initiated several initiatives that utilizes the company's resources to meet community needs and to encourage sustainable economic development. These efforts have included job training programs, vocational workshops, literacy programs, donations to local schools, health and family planning workshops, and microfinance training sessions.</p> <p><u>Source:</u> 12 Los Cocos II CDM Project Design Document, Los Cocos Libro de Mesa, Capítulo IV (LCLM),12 Memoria 2012 Social Responsibility</p>	<p>*Annual or semiannual updates that keep track of community quality of life has changed or improved as a result of the project and its associated programs and initiatives.</p>
	<b>16</b>	<p><b>Restorative</b></p>	
<b>PL1.2 Stimulate Sustainable Growth &amp; Development</b>		<p>*Formulating a company policy that will make it priority to train or hire locals for repair, emergency response, or service jobs</p> <p>*Analysis documenting how many people will be benefited by the project and how will it improve community prospects indirectly for sustainable economic growth and development.</p>	

		<p>According to the CMD project document Los Cocos wind farm has provided employment opportunities in the project site during the assembly process and for the duration of the plant's operation. Sercitec's Environmental Impact Assessment has estimated that the construction phases have required the hire of a 150 construction crew consisting of carpenters, welders, electricians, engineers, and others. The coverage has been estimated to be local, drawing in workers from Juancho and other parts of the Pedernales province. During the operation of the project 32 people will be required distributed as follow: 5 technical employees from EGE Haina; 3 of Cobra Energy UTE Los Cocos; 24 posts to ensure the safety on site. (12 DIA-PMAA P E LC p.84).</p> <p>EG Haina has helped improve the local economy by providing electricity and social programs. The wind farm now powers the irrigation systems of local farms. EGE Haina sponsored a workshop for a local beekeepers taught by two consultants from the beekeeping Network. They have also offered assistance to local fishermen by providing training to help organize their guild, promote sustainable fisheries, and expand their employment options in closed seasons by hiring them to clean beaches and mangroves. The clean-up efforts have been set in place to improve local ecology and to promote ecotourism in the southern provinces. EGE Haina has also worked to increase recreational opportunities through its sponsorship of art and athletics. They have repaired the basketball court in the Juancho Colony and the Punta Pescadora softball stadium in San Pedro de Macoris. They have also sponsored basketball tournaments in Barahona, San Pedro de Macoris and Puerto Plata, and cycling events around Barahona-Pedernales. Communities surrounding the wind farm have also received donations of over 300 sports leagues uniforms EGE Haina has also given financial support to the Barahona Symphonies Youth Band.</p> <p><u>Source:</u> 12 Los Cocos II&amp;I CDM Project Design Document, P.3 Sustainable Development, 12 DIA-PMAA Parque Eólico Los Cocos, p.84, 12 Los Cocos Libro de Mesa, Capítuo IV, P.75 "De mano de la comunidad" p. 79, 12 memoria 2012 Social Responsibility p. 4, 12 Los Cocos Libro de Mesa, Capítuo IV, P.75 "De mano de la comunidad" p. 83, 12 Los Cocos Libro de Mesa Digital p. 68, 12 Memoria 2011 Responsabilidad Social, p.6 p.8</p>	
<p><b>PL1.3 Develop Local Skills and Capabilities</b></p>	<p><b>12</b></p>	<p><b>Conserving</b></p>	<p>*Documentation showing how the new educational programs and the availability of electricity has led to an increase in community economic competitiveness                  *Assessment of outreach programs showing they have addressed identified community needs and shortfalls</p>

	<p>Sercitec’s 2011 environmental impact report projected that the construction process will have resulted in the employment of 150 individuals due to the project’s demand for carpenters, welders, electricians, and engineers. During the operation of the project 32 people will be required distributed as follow: 5 technical employees from EGE Haina; 3 of Cobra Energy UTE Los Cocos; 24 posts to ensure the safety on site.</p> <p>. As a result the company has initiated educational efforts as a way of improving local economic opportunities. EGE Haina has sponsored a youth and adult literacy program in Juancho, equipped the Guarocuya Technical School in Enriquillo with solar and wind energy sources to power a computer lab, provided internet access to the Enriquillo Lyceum, and they have also sponsored Juancho’s early childhood education center Los Farolitos, which provides tutoring to children who had no access to schooling. The surrounding communities have also benefited from EGE Haina efforts to provide electrical services and career training opportunities. The wind farm powers the drip irrigation system of the fields surrounding Los Cocos. Through a \$ 3.2 million investment the company has helped rehabilitate the electrical transmission to Southern Dominican communities like Los Cocos, Juancho, Villa Esperanza, and Oviedo. The investment has allowed for the installation of a 138/12.5 kV transformer allowing the communities to receive continuous and reliable supply of power (12 M2011 RS, p.8). EGE Haina has also provided counseling to Juancho fishermen on how they can organize their guild and promote sustainable fishing practices. EGE Haina also works with the Agricultural Development Project" Juancho Valley" (PRODEVAJ) to clean arable land and collaborate with irrigation for agricultural production. In Juancho Colony the company also donated a stove and a refrigerator, and wood to build a restaurant. The Company has also standardized its training program for wind farm tour guides in order to open to the vocation up to locals.</p> <p><u>Source:</u> 12 Los Cocos Libro de Mesa, Capítulo IV, P.75 "De mano de la comunidad" 83, 12 Memoria 2011 Responsabilidad Social, 12 Memoria 2012 Responsabilidad Social</p>	
<p><b>PL2.1 Enhance Public Health And Safety</b></p>	<p><b>No Score</b></p> <p>0</p> <p>New technologies, materials or methodologies have the potential to pose risks to the health and safety of the communities surrounding the project. The Wind farm will utilize wind turbines which will convert the kinetic energy of the wind into electrical energy. This technology has been available since the 1880’s but has gained widespread interest as an alternative source of energy to fossil fuels. Wind power has only been used privately in the Dominican Republic making this a new technology for the country’s public energy production. Other than the noise assessment made by GL Garrad Hassan no documentation has been provided to indicate an full assessment of the possible risks initiated by the implementation of this technology. The noise produced by the Juancho-Los Cocos was found to be within the recommended limits by the applicable international and national guidelines, i.e. the WHO, the Normas Ambientales para la Protección Contra Ruidos, and the IFC World Bank Group EHS Guidelines, for the nearest occupied dwelling identified and considered within this study. The project does utilize a comprehensive emergency response plan with a special category of safety protocol for spills.</p> <p><u>Source:</u> 12 Ruido. 1012_NIA_EGE-Haina_ 1012OR02a_ 20110822_JM, P.20, 12_Ruido.ANEXO 3.1 INFORME CALIDAD AMBIENTAL, P.21, 12 Programas de Manejo &amp; Respuestas a Emergencias</p>	<p>*Documentation of a full assessment of the resulting risks of a wind farm in the area along with plans to modify the project according to the found risks would result in a higher score.</p>

<b>PL2.2 Minimize Noise And Vibration</b>	<b>8</b>	<b>Conserving</b>	<p>*Execution and documentation of successful efforts to reduce noise from the plan or to create barriers to block ambient noise could lead to higher scores in this category.</p>
		<p>GL Garrad Hassan has performed a noise measurement investigation near the Juancho-Los Cocos and Quilvio Cabrera Wind Farms in Dominican Republic from 25 May to 28 May 2011. The resulting data showed significant variability in measured sound levels, which is considered typical of such an environment. Most of the recorded ambient sound came from, traffic on the adjacent highway, farm animals, and human activities (12 R 1012 ANM EGE-H1012OR01 20110822 JM,P.18/22). The noise produced by the Juancho-Los Cocos wind farm was found to be within the recommended limits by the the applicable international and national guidelines, i.e. the WHO, the Normas Ambientales para la Protección Contra Ruidos, and the IFC World Bank Group EHS Guidelines, for the nearest occupied dwelling identified and considered within this study. Another study directed by the civil engineer Juan Nicolás Faña Batista found that sample noise levels in the area are significantly lower than the limit of 70 dBA most of the time. Higher peaks can be found near vehicular traffic, however this noise level is not connected to the activities of the plant. Thus no corrective action has been required or recommended.</p> <p><u>Source:</u> 12 Ruido. 1012 NIA EGE Haina 1012OR02a 20110822 JM p.20, 12 Ruido. 1012 NIA_ EGE Haina 1012OR02a 20110822 JM p.20</p>	
<b>PL2.3 Minimize Light Pollution</b>	<b>0</b>	<b>No Score</b>	<p>*Documentation to substantiate claims of a completed overall assessment of overall lighting needs, reduced or eliminated light spillage into sensitive environments, and preservation of the night sky</p>
		<p>The data documentation sheet claims that the project team will conduct an overall assessment of lighting needs for the project, design the lighting components of the project in a way that reduces energy consumption, and will design the lighting components of the project to reduce or eliminate light spillage into sensitive environments and preserve the night sky. However, no documentation has been provided to substantiate this claim.</p> <p><u>Source</u></p>	
<b>QL2.4 Improve Community Mobility And Access</b>	<b>1</b>	<b>Improved</b>	<p>*Documentation showing that mobility improvements have been made using the input for operators of nearby facilities or hubs.</p> <p>*Documentation showing reduced negative impacts during road construction.</p>
		<p>The project team recognizes the need and utility in providing access to adjacent facilities, amenities and transportation hubs. Photo-documentation shows that before the construction the road on site was a narrow dirt path lined with trees. After construction the trees have been cleared and the road is noticeably wider and flatter allowing it to accommodate vehicles and pedestrians. The company has also repaired the road at the El Carril de Haina.</p> <p><u>Source:</u> 12 Foto caminos antes del Proyecto,12 Foto Camino Despues,12_Foto Camino Despues1, 12 Foto Camino Despues2, 12 Memoria 2011 Responsabilidad Social, p.6,8</p>	
<b>QL2.5 Encourage Alternative Modes of Transportation</b>	<b>0</b>	<b>No Score</b>	<p>*Documentation provided to prove this claim as well as an indication that the parking of motorized vehicles is restricted in or around the constructed works, would result in a score of improved or higher.</p>
		<p>The data documentation sheet claims the project will be within walking distance of accessible multi-modal transportation because the project site is adjacent to the only highway in the area, and their access roads lead to this highway, where public transportation is readily accessible. However there is no documentation provided to support this claim.</p> <p><u>Source</u></p>	

<b>QL2.6 Improve Site Accessibility, Safety &amp; Wayfinding</b>	<b>0</b>	<b>No Score</b>	*Documentation of emergency routes
		Both during the construction process and during operation the company has utilized the appropriate cautionary signage. Constructed areas are marked with signs that translate to “men at work. Also, exterior facilities are gated with signs that read “Danger High Voltage” and “Caution.” The surrounding roads also make use of stop signs and indications of the speed limit. However no documentation has been provided to indicate appropriate emergency routes.  Source: 12 Foto Señalización.jpg, 12 Hombres trabajando.jpg, 12 Letrero AG8.jpg, 12 Letrero Alto Voltaje Subestación.jpg, 12 Letrero Bienvenida.jpg, 12 Letrero Uso EPP's.jpg, 12 Precaucion.jpg, 12 Ruta del Viento 1.jpg, 12 Señal Pare.jpg, 12 Señalización de Velocidad.jpg	
<b>QL3.1 Preserve Historic And Cultural Resources</b>	<b>0</b>	<b>No Score</b>	
		No outside sources like the CMD reports and Sercitec’s Assessment have made any note of important cultural or historical sites in the area  Source	
<b>QL3.2 Preserve Views And Local Character</b>	<b>6</b>	<b>Superior</b>	*Documentation showing that the company has worked with the community to formulate policies that will help protect local views and character
		The wind turbines stand at 80 meters where there are no tall buildings they are noticeably imposing on the landscape. However locals have come to consider the turbines a part of the new local character because they symbolize economic hope and have the potential to bring tourism. EGE Hainia has also worked to enhance local character by sponsoring initiatives to clean the beaches and mangrove forests of Juancho and Enriquillo in order to promote the location as a site for ecotourism. In August of 2012 the company sponsored the first EGE Haina MTB Competition in Juancho Los Cocos which promoted the region as a tourist destination where local artisans were allowed with opportunities to sell products.  Source: 12 Memoria 2011 Responsabilidad Social p.78-79, 12 Memoria 2011 Responsabilidad Social p 84, 12 Memoria 2012 Social Responsibility p. 5	
<b>QL3.3 Enhance Public Space</b>	<b>13</b>	<b>Restorative</b>	
		EGE Haina is implementing initiatives to improve and restore existing surrounding public space that include mostly recreational spaces, beaches, and mangroves. The Wind Farm will not be in an urban/residential space thus it will not take the place of any existing public spaces. Since wind power requires open windy space it is unlikely that the farm will ever expand into an area where urban public space is affected. EGE Haina has made efforts to enhance public recreation spaces in the surrounding communities. They carried out an initiative to improve sports facilities in Juancho, by lighting up the community basketball court and playground restoration. They also repaired the community tennis courts in Juancho Colony and the softball stadium in Punta Pescadora, in San Pedro de Macoris. In an effort to promote local ecotourism the company has also carried out an initiative to clean the beaches and mangroves of Juancho and Enriquillo. Finally, the company is in the process of developing a community center that will facilitate recreational and educative activities in the areas neighboring the wind farm.  Source: 12 Los Cocos Libro de Mesa p. 83-84, 12 Los Cocos I CDM Project Design Document, 12 Los Cocos II CDM Project Design Document, 12 Los Cocos Libro de Mesa Digital p 68	

<p><b>QL0.0 Innovate Or Exceed Credit Requirements</b></p>	<p>8</p>	<p>EGE Haina has made a priority of expanding general and environmental education among local communities. EGE Haina sponsored early childhood education center The Farolitos, which provides tutoring to children who had no access to schooling. The staff consists of three educators who work a total of 60 hours a week with about 82 children. They have also supported Juancho Primary School's literacy program benefiting over 200 individuals in the community. They have collaborated with the Sur Futur0 Foundation to train teachers and students in various subjects, emphasizing the conservation of natural resources. Additionally they are promoting the study of riparian, coastal, and lagoon water among children and adolescents through hands-on pollution studies lead by the Caribbean Student Environmental Alliance. Through their sponsorship the Guarocuya Technical School in Enriquillo, was equipped with solar panels and a small wind turbine, which allows the use of computer lab for 430 students and 16 teachers (12 LC LM CIV p.75,83). With the technical collaboration of World Water Relief of Atlanta they are working to install water systems in four schools in the area (12 LC LM CIV p. 84). EGE Haina worked directly with Juancho Primary School to rebuild the entire septic system and all bathrooms. A collaboration with two Rotary Clubs with the United States has allowed the company to install a new water system, build an outdoor classroom, donate 100 desks, and give internet access to Juancho Primary(12_M 2012 RS p.4). EGE Haina has donated garbage cans and drinking water system to Juancho Colony Primary School. EGE Haina has brought internet access to Enriquillo's Lyceum and Technical Lyceum, in addition to donating 600 backpacks for students, garbage bags and gloves (12_M 2012 RS p.4)</p> <p>Sources: 12 Los Cocos Libro de Mesa, Capitulo IV, 12 Memoria 2012 Social Responsibility</p>	
<p>89</p>			

<p>SUB CATEGORY: LEADERSHIP</p>			
	<p>LOS COCOS WINDFARM. DOMINICAN REPUBLIC</p>		<p>RECOMMENDATIONS</p>
<p><b>LD1.1 Provide Effective Leadership And Commitment</b></p>	<p>9</p>	<p><b>Superior</b></p> <p>There is significant commitment and effective leadership across the organization. EGE Haina's interest in developing a wind farm in the southern region of the Dominican Republic has been the part of a 15 year long process. In 1997 the Company began taking wind measurements in the southern provinces (12 LC LMD p.61). The resulting data has fueled the company's confidence in the viability of wind production in Los Cocos despite initial technical setbacks and the shipping obstacles that emerged as a result of the 2008 oil crisis. Edgar Pichardo, President of EGE Haina has stated that the mission of the company is twofold. First, it wants to provide the nation with reliable electricity at competitive prices, through a plan of sustained investment in technology. Second, EGE Haina aspired to benefit the site of the wind farm through the preservation of the environment and development of the communities where it operates (12 LC LMD p. 64). The company's shareholders are determined to reinvest each year, in accordance with the Endowment Fund of Reformed Businesses (FONPER). VICINI, a shareholder of EGE Haina is a privately held asset management committed to talent management and sustainable development of the Dominican Republic. EGE Haina has demonstrated its commitment to the economic growth of the South shaping an agreement with CDEEE and EDESUR to finance the adaptation of the circuits that supply the communities surrounding the park. The plant powers the drip irrigation system that</p>	<p>*Documentation indicating company policy that demonstrates sustainability as the core value of the company and its project team *Documentation showing that non sustainable practices have been or will be addresses.</p>

		<p>provides water to the fields where the park is located. The have also sponsored several initiatives to promote ecotourism, improve local schools, and increase the skills of local workers.</p> <p><u>Source:</u> 12 Los Cocos I CDM Project Design Document,12 Los Cocos II CDM Project Design Document, 12 Los Cocos Libro de Mesa Digital</p>	
<p><b>LD1.2 Establish A Sustainability Management System</b></p>	<p><b>7</b></p>	<p><b>Superior</b></p> <p>There are sufficient set of business processes and management controls to address most any issue including sustainability through various monitoring programs. The Monitoring and Verification Plan will be instated to conform electricity production and emission reduction it will be implemented over the 7-year CDM crediting periods of project activity. Electricity generation and emission reductions of the project will be monitored by a project staff responsible for the maintenance of traceable and updated records. The CDM project Coordinator will be in charge of CDM data monitoring and recording activities, and review of calculations on emission reductions. The Coordinator will be responsible for communications with CDM personnel and for miscellaneous procedures related to CDM project activities. The Commercial and Monitoring Department will report to the project coordinator.</p> <p>The Commercial Department will be responsible for running and updating the model to calculate the emission factor of the electricity system. They will gather information on electricity generation by the project activity, and calculate the emission reductions.</p> <p>The Monitoring Department will be in charge of printing/retrieving data on electricity generation, and reporting to the commercial department. They are responsible for gathering data on electricity displaced by the project activity every hour and reporting on any condition that could prevent the monitoring or data acquisition by the control system.</p> <p>Verification of emission reductions are to be carried out annually. However monthly reports will be developed based on the monitoring data and the calculations of emission reductions. This will be done in order speed up the final verification process, and to provide a tracking of the project progress in order to identify any potential problem. Sercitec’s environmental evaluation has concluded that the project’s negative impacts will mostly affect the physical environment but will mostly occur during the construction processes after which the magnitude of the damages will decrease over time. The socio-economic environment, on the other hand, will receive most of the positive impacts. The evaluation was followed up by an environmental management and mitigation program which will Los Cocos will use to address any negative impacts of the project. The PMAA is a program for management of temporary facilities, activities during construction, abandonment of temporary facilities, environment, health and security, emissions and noise, fauna, social management, and for dismantling and abandonment.</p> <p>In order to address the concerns of the community, three stakeholders meetings were held during 2010 to get a feedback from local, governmental agencies, electricity sector authorities, students, general interested public, and the individuals directly affected by the implementation of the project. The comments received by local stakeholders about the implementation of the project activity were positive and in line with the main social and environmental concerns of the local community.</p> <p><u>Source:</u> 12 Los Cocos I CDM Project Design Document, pp. 73, 77,88 , 12 Los Cocos II CDM Project Design Document, P.59</p>	<p>*Documentation indicating management responsiveness and resilience to changing design, market, and environmental variables.</p>
		<p><b>LD1.3 Foster Collaboration And Teamwork</b></p>	



<p><b>LD1.4 Provide For Stakeholder Involvement</b></p>	<p>9</p>	<p><b>Superior</b></p> <p>Engagements expand to a wider community, people and relevant groups that are affected by or have an interest in the project. In order to address the concerns of the community three stakeholders meetings were held during 2010 to get feedback from local, governmental agencies, electricity sector authorities, students, general interested public, and individuals directly affected by the implementation of the project. The first meeting was held on July 1st, 2010 with attendance of the State-owned Dominican Company of Electricity Enterprises, the National Energy Council, the Climate Change and CDM Council, the Electricity Superintendence, the United Nations Development Program, Environmental Mitigation and Management Plan (UNDP), the Rural Suburban Electrification Unit, the Environmental and National Resources Ministry, the Ministry of Economy, Planning and Development, the Coordinating Body for the National Electrical System of the Dominican Republic, the Electric Transmission Company, and personnel from CEPM and HAINA. This meeting took place at the offices of the Climate Change and CDM Council.. The second stakeholders’ meeting was held in Pontifical Catholic University on the 1st of July of 2010, at the University “Pontificia Universidad Católica Madre y Maestra” (PUCMM) where an invitation was extended to the student body. The third stakeholders’ meeting was held with the community at the project site on August the 6th, 2010 with local stakeholders. During each meeting the attendees were given a questionnaire which asked the following questions: “1. With reference to the available information and your knowledge in Environmental issues, Climate Change, Kyoto Protocol and Clean Development Mechanism, please express briefly your opinion on the Los Cocos Wind Farm. 2. Do you recommend to the private entities, government authorities, and other organizations to develop this kind of projects, for electricity generation based on wind renewable energy as a contribution to climate change mitigation? (12 LC I CDM PDD p. 83) 3. Do you consider that the wind project will contribute to sustainable, environmental, economic, and social development of the region and Dominican Republic?” (12 LC I CDM PDD p. 84). Comments received by local stakeholders were generally positive about the implementation of the project activity and believing that they were in line with the main social and environmental concerns of the local community (12 LC I CDM PDD p.88). Two meetings were held again in 2012 consultation with stakeholders. The first stakeholders’ meeting was held at Pontifical Catholic University, in Santo Domingo on 15 March 2012. National authorities and international organizations such as the World Bank, the Inter-American Development Bank (IDB) and the United Nations Development Programme (UNDP) were invited by letters. National authorities in attendance included organizations such as the State-owned Dominican Company of Electricity Enterprises, the National Energy Council (Executive Director and Manager of Renewable Energy), the Climate Change and CDM Council, the Electricity Superintendence, the Ministry of Environment and National Resources (Minister as well as Vice Minister of Environmental Management), the Ministry of Economy, Planning and Development, the Coordinating Body for the National Electrical System of the Dominican Republic, the National Competition Council, the Electric Transmission Company (ETED) The second stakeholders’ meeting was held for with the community at project site on March 17, 2012. A questionnaire was circulated during each stakeholder meeting. The first meeting yielded favorable comments. Many people suggested that there should be an expansion of renewable energy in general. One suggested diversifying across renewable energy sources. The second meeting also yielded favorable comments. persons filled in questionnaires following the second stakeholder meeting. The comments were all favorable among</p>	<p>*The implementation of stakeholder involvement could be expanded to make it have more public input. Rather than using the meetings as an informational session for the public they could modify it to allow for project changes to be drafted based on stakeholder discussions.</p> <p>*Documentation clarifying how the energy supply works in the region (i.e. Is the drip irrigation system powered for free, do the people of the community receive a discount on power? etc).</p>
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		<p>community groups. Some requests were made for services unrelated to the project activity like the installation of public toilets, maintenance and construction of sports facilities, education, etc. A few suggested that the company should provide free service, for the use of the land. Some asked that the project provide jobs to the community members. EGE Haina donated an electrical substation that will allow EDESUR to obtain a circuit for supplying reliable and quality power. Additionally, EGE Haina made an agreement with CDEEE and EDESUR to finance the adaptation of the circuits that supply the communities surrounding the park. For instance, the project plant powers the drip irrigation system that provides water to the fields where the park is located. They also provide assistance, advice and training in better agricultural practices to farmers. Because fishing is central economic activity in this area, they work with fishermen to expand their skills, help organize their guild, promote sustainable fisheries, and expand their employment options in closed seasons by hiring them to clean beaches and mangroves. The clean-up efforts have been set in place to improve local ecology and to promote ecotourism in this South. EGE Haina has also worked to increase recreational opportunities through its sponsorship of art and athletics. They have repaired the basketball court in the Juancho Colony and the Punta Pescadora softball stadium in San Pedro de Macoris. They have also installed potable water systems in local schools and sponsored a literacy program for adults and youths.</p> <p><i>Source:</i> 12 Los Cocos I CDM Project Design Document, p.68,77-79,82, 12 Los Cocos II CDM Project Design Document, p.6,60, 65, 12 Memoria 2011 Responsabilidad Social, p, 6,8, 12 Los Cocos Libro de Mesa p. 83</p>	
<b>LD2.1 Pursue By-Product Synergy Opportunities</b>	<b>0</b>	<p><b>No Score</b></p> <p>Residual material from material transportation and construction were donated to the community around the wind farm. These included wood frames donated to the community for the construction of benches and tables</p> <p><i>Source</i> Email FW Madera, Nov 2012 Los Cocos Community Dev</p>	*Documented assessment of the unwanted materials or byproducts produced by local facilities and found a way to utilize them during the construction process.
<b>LD2.2 Improve Infrastructure Integration</b>	<b>16</b>	<p><b>Restorative</b></p> <p>The project takes into account the operational relationships among other elements of community infrastructure which results in an overall improvement in infrastructure efficiency and effectiveness. The communities around Los Cocos wind farm are considered to be among poorest in the Dominican Republic. Their remoteness from the center of production and large populations makes it difficult for them to receive electricity of good quality and voltage. As part of the project, EGE Haina constructed a high transmission line interconnecting Los Cocos with the National Grid. Together with the local electricity distribution company, EGE Haina invested in the distribution level interconnection of the community, bringing efficient electricity to thousands of families. The plant now powers the drip irrigation system that provides water to the fields surrounding the wind farm.</p> <p><i>Source:</i> 12_Los Cocos Libro de Mesa, p 68,85, 12 Los Cocos I CDM Project Design Document, 12 Los Cocos II CDM Project Design Document</p>	
<b>LD3.1 Plan For Long-Term Monitoring &amp; Maintenance</b>	<b>10</b>	<p><b>Conserving</b></p> <p>As part of their inclusion as a Clean Development Mechanism, Los Cocos has a comprehensive monitoring plan to document its yearly emission reductions. Also they have operation and maintenance agreements with the wind turbine suppliers to guarantee the longevity of our operations</p> <p><b>Monitoring Plan</b></p> <p>The Monitoring and Verification Plan will be instated to conform electricity production and emission reduction, and will be implemented over the 7-year CDM crediting periods of project activity. Electricity generation and emission reductions of the project will be monitored by a project staff responsible for the maintenance of traceable and updated records. The staff will consist of a</p>	

		<p>monitoring department and a commercial department who will answer to the CDM project Coordinator. Verification of emission reductions are to be carried out annually. However monthly reports will be developed based on the monitoring data and the calculations of emission reductions. This will be done in order speed up the final verification process, and to provide a tracking of the project progress in order to identify any potential problem (12 LC I CDM PDD p 73)</p> <p>The technical staff related to the O&amp;M of Los Cocos Wind Farm will receive training consisting of a V90 course offered by Vestas which includes the following subjects, among others: Introduction to wind energy; Safety; Power regulation; Control system: Generator; Operational modes; Yaw system; Gearbox; Electrical system; V90 brake hydraulics; V90 pitch hydraulics and SCADA. Additionally, a safety course will be taken by a member of the staff involved in Los Cocos Wind Farm operation. New employees will be formed in the specific skills required to carry out the Monitoring Plan. HAINA has subcontracted the operation and maintenance of the wind project for its first ten years to UTE Los Cocos (a subsidiary of COBRA Wind). UTE Los Cocos will maintain and service Los Cocos Wind Farm in proper working order in accordance with the Mechanical Operating and Maintenance Manual, and the Electrical Operating and Maintenance Manual. The scheduled maintenance tasks are preventive measures that include service to the different components of the wind turbines such as yaw system, gearbox, brake hydraulics, generator, lubrication unit, nacelle, meteorological equipment and electrical parts. In addition, unscheduled maintenance tasks for Los Cocos Wind Farm will be performed promptly, as and when necessary, to keep and maintain the plant in good working order (12 LC I CDM PDD p.74).</p> <p><u>Source:</u>12 Los Cocos I CDM Project Design Document</p>	
<p><b>LD3.2 Address Conflicting Regulations &amp; Policies</b></p>	<p><b>0</b></p>	<p><b>No Score</b></p> <p>Laws regulations, policies or standards of practice affecting the project are taken as a given regardless of their intended purpose or compatibility with sustainability goals and objectives. Los Cocos is a 52 MW capacity wind farm and currently the only grid-connected large scale project to be implemented under the Law on Incentives for the Development of Renewable Energy Sources and Special Regimes, No. 57-0729 and its Implementation Regulation 30. This law promotes wind farms with a capacity of up to 50 MW. Incentives include a 100% exemption of import duties for equipment, machinery and accessories required for renewable energy production, 100% exemption over sales tax for all above mentioned equipments, and 100% 10-year exemption over income tax, for companies benefited by this law until year 2020. The project complies with Baseline Scenario A, requiring that be consistent with the current laws and regulations of the country. The project activity complies with all applicable legal and regulatory requirements under the General Electricity Law. While the Law on Incentives for the Development of Renewable Energy Sources and Special Regimes, states that wind farms with overall installed power of under 50 MW would be entitled to the incentives established by the Law, Article 2, paragraph II of the Regulations for the implementation of the Law indicates that the upper limit could be doubled for projects that install at least 50% of the original capacity requested. A capacity of 50 MW was initially requested and 25 MW constructed (Los Cocos Wind Farm Project, another CDM project currently in validation), thus this condition is met.</p> <p><u>Source:</u> 12 Los Cocos II CDM Project Design Document, P.21, The Law on Incentives for the Development of Renewable Energy Sources and Special Regimes, No. 57-0729</p>	<p>*Documented assessment of negative impacts on sustainable development from conflicting regulations and policies</p> <p>*Documentation showing that the project team has worked with regulators to mitigate negative affects</p>
<p><b>LD3.3 Extend Useful Life</b></p>	<p><b>1</b></p>	<p><b>Improved</b></p> <p>Considerations of flexibility, durability, and resilience are minimally considered to extend the project’s useful life. As part of their inclusion as a Clean Development Mechanism, Los Cocos has a comprehensive Monitoring plan to document its yearly emission reductions. The operation and</p>	<p>*Information about what plans are in place are to account for flexibility in the project, multiple uses,</p>

		<p>maintenance agreements with the wind turbine suppliers were made to guarantee the longevity of our operations duration through the Monitoring Plan implementation. EGE Haina is investing close to US\$5.0 million a year on the operation and maintenance of the project, retaining for 10 years the international contractors of the project to ensure the project's longevity</p> <p><i>Source:</i>12 Los Cocos I CDM Project Design Document, pp. 73 "Description of the monitoring plan"</p>	and reconfiguration could allow for a higher score.
<b>LD0.0 Innovate Or Exceed Credit Requirements</b>	<b>0</b>	N/A	
	<b>52</b>		

<b>CATEGORY II: CLIMATE AND ENVIRONMENT (CE)</b>			
<b>RESOURCE ALLOCATION</b>			
	<b>LOS COCOS WINDFARM. DOMINICAN REPUBLIC</b>		<b>RECOMMENDATIONS</b>
<b>RA1.1 Reduce Net Embodied Energy</b>	<b>0</b>	<p><b>No Score</b></p> <p>The data documentation sheet states that the project team has neither conducted an assessment of the embodied energy of key materials, nor will the project achieve a reduction of net embodied energy over its lifetime. Since no documentation has been provided to confirm or deny this, the project will not be given any points for reduction of net embodied energy.</p> <p><u>Source:</u></p>	<p>*An assessment of the embodied energy of key materials over the project life conducted by a reliable third party using up to date methods and software.</p> <p>*At least a 10% reduction in net embodied energy over the life of the project</p>
		<p><b>Superior</b></p> <p>The project consist of a total of 26 wind turbines manufactured by the Gamesa Corporación Tecnológica, a Spanish corporation that specializes in the production of wind turbines and wind farms.The company operates under a sustainability strategy that seeks to contribute to carbon emission reduction through its production of technological solutions to sustainable energy demands and through its three strategic priorities: integrity, identify, and visibility. Through its priorities Gamesa seeks to a model of ethical business practices that will lower its carbon footprint, encourage corporate responsibility, and help the communities where its projects develop. The companies efforts have gained it international recognition. As of 2012 it has been listed for the sixth consecutive time in the Dow Jones Sustainability Indexes which highlights sustainability practices, based on financial, environmental and social criteria, where it led in rankings for Renewable Energy Equipment. Merco ranked Gamesa Number 39 in a study assessing corporate reputation. It also ranked Gamesa Number 27 in the list of companies exercising corporate responsibility and good corporate governance. Gamesa was also listed as one of the top ten Ibex-35 companies with the best sustainability report by Spain's CSR Observatory. . Before 2011 The los cocos Windfarm was planned to consist of turbines from two companies; Gamesa and Vestas. Originally the turbines were going to be purchased from Gamesa and Vestas Wind systems however a reduction in the project sized lead to the purchase of exclusively Gamesa turbines. Vestas also has a sustainability based</p>	
<b>RA1.2 Support Sustainable Procurement Practices</b>	<b>6</b>		

		<p>corporate strategy. Its goal as a company is to make wind power an energy source comparable in performance, reliability and quality to fossil fuels. The company has a goal to reduce its carbon footprint by 15% and increase its recyclability by 85% by 2015. As of now it has reach a recyclability of 80 %</p> <p>EGE Haina's The "Requirements for participating in Bids" outlines participation requirements which included a clean criminal record for collaborators. The "Procurement Process Summary:" outlines the protocol for purchasing goods and services, but none of the bidding requirements or purchasing steps contain sustainability/environmentally based criteria</p> <p>Source: 12 Los Cocos II CDM Project Design Document, Gamesa 2012-resumen informe sostenibilidad page 37, Gamesa 2012 resumen informe sostenibilidad page 39, Vestas Sustainability report 2010 page 6,13, 12 Resumen Requisitos Licitaciones (draft)</p>	
<b>RA1.3 Used Recycled Materials</b>	<b>0</b>	<p><b>No Score</b></p> <p>No documentation has been provided to show that the project has utilized recycled materials in the construction process either through the reuse of existing structures or the use of recycled or reclaimed materials</p> <p>Source:</p>	<p>*Incorporation of recycled materials in the construction process either through the reuse of existing structures or the use of recycled or reclaimed materials.</p>
<b>RA1.4 Use Regional Materials</b>	<b>9</b>	<p><b>Superior</b></p> <p>10% of the project's total materials were sourced locally with 90% of civil construction materials coming from local suppliers or sources. The Silty, clayey, Sandy gravel which was were used as concrete aggregates originating from El Arroyo Mine. Metal rebar came from Dominican supplier METALDOM . The Turbines were supplied by spanish company Gamesa.</p> <p>Source: 03 Informe segunda quincena de Febrero del 2012 Ampliación Los Cocos pages 37-105, 06 Informe Primera Quincena Abril del 2012 Ampliación Los Cocos page 6</p>	<p>*Documentation of soil reuse for roads or paving on project site</p> <p>*Documentation of the origins of lumber used in project</p> <p>*Consider importing domestically unavailable equipment from a closer source.</p>
<b>RA1.5 Divert Waste From Landfills</b>	<b>3</b>	<p><b>Improved</b></p> <p>Sercitec's Environmental Mitigation and Management Program states that during the construction process "an agreement with the municipality was established for the the disposal of solid waste into to the municipal landfill." However the "the practice of recovering reusable waste such as paper, plastics, glass, wood scrap." is encouraged. Scrap wood from the construction phase of the project was donated to the Juancho neighborhood beautification board to repair its enramada, to Juancho Colony to build a restaurant, to Enriquillo for the construction of a restaurant and to Juancho Colony's Maternity center for the construction of tables and benches.</p> <p>Source: Nov 2012 Los Cocos Community Development Memo,12 Declaración de Impacto Ambiental Los Cocos pages 110-110</p>	<p>*Development of a more comprehensive operations waste management plan to decrease and divert project waste from landfills and incinerators during construction and operation.</p> <p>*Documentation proving 50% or higher recycle/reuse of project waste.</p>
<b>RA1.6 Reduce Excavated Materials Taken Off Site</b>	<b>0</b>	<p><b>No Score</b></p> <p>While the data documentation sheet claims that all excavated material was re-used in road conditioning, No documentation has been provided to confirm or deny this.</p> <p>Source:</p>	<p>*Documentation proving reuse of of all excavated material.</p>

<p><b>RA1.7 Provide for Deconstruction &amp; Recycling</b></p>	<p>1</p>	<p><b>Improved</b></p> <p>Sercitec’s Environmental Mitigation and Management Program states that during the disassembly project “leftover materials that can be reused will be temporarily stored in work fronts so they do not interfere with transit. They will also be covered using waterproof material to protect against erosion by wind and water(DIALC, p. 160). The entire develop actions will be documented in an environmental report that will be submitted to the environmental authorities.” There is a basic end of life consideration for materials although no exact figures are provided to account for the percentage of components that will be set aside for reuse / upcycling or recycling, this management program does outline a disassembly process with a general plan of good practice and a promise of a final environmental report.which goes beyond the norm of most energy development projects.</p> <p><u>Source:</u> 12 Declaración de Impacto Ambiental Los Cocos page 160</p>	<p>*An assessment of whether materials specified can be easily recycled or reused after the useful life of the project has ended.                  *A project plan that designs the project so that a significant amount of project materials can be easily separated for recycling or readily reused at the end of the project's useful life.                  *Documentation proving that 10% of the project materials or components can be reused through reconstruction or recycling.</p>
<p><b>RA2.1 Reduce Energy Consumption</b></p>	<p>0</p>	<p><b>No Score</b></p> <p>According to Sercitec’s Environmental Impact assessment the “mobilization of machinery and equipment” and “ transportation of materials and personal” both resulted in carbon and nitrogen emissions. This impact was declared local and of medium magnitude.Since the end of construction the project has been consuming a negligible amount of energy (2.97%) compared to the amount it has been producing.</p> <p><u>Source:</u> 12_ Declaración de Impacto Ambiental Los Cocos page 82, 12Los Cocos II CDM Project Design Document II page 23</p>	
<p><b>RA2.2 Use Renewable Energy</b></p>	<p>20</p>	<p><b>Restorative</b></p> <p>This project is a wind farm which will supply renewable energy to the national power grid. Wind energy does not produce any emissions since the electricity is generated from the wind’s kinetic energy. According to the CDM II report , the Los Cocos wind farm is expected to produce 157,189 sellable MWh/year(12 LC II CDM PDD p.1). The resulting electricity will displace energy based on fossil fuels that would have generated 112,489 tonnes of CO2 emissions (12 LC II CDM PDD p.23).</p> <p><u>Source:</u> 12_ Los Cocos II CDM Project Design Document pages 1, 23</p>	<p>*Not applicable, has reached highest score</p>

<p><b>RA 2.3 Commission &amp; Monitor Energy Systems</b></p>	<p>11</p>	<p><b>Conserving</b></p> <p>According to the second CDM project design document, “the turnkey design, engineering, supply, transportation, construction, erection, installation, commissioning, testing and completion of the wind farm” will be conducted by COBRA Energy, a company chosen for its depth of experience in the construction and operation of wind farms. The wind farm will be operated by COBRA under a ten year O&amp;M agreement, during which the wind farm operators will work side by side with COBRA’s engineers, which will then enable them to transfer knowledge to the EGE HAINA staff</p> <p>The document also states that the technical staff related to the O&amp;M of Los Cocos Wind Farm will receive training through a V90 course offered by Vestas. This course will provide an Introduction to wind energy and it will cover power regulation, generator control systems, operational modes, yaw systems, gearboxes, electrical systems, V90 brake hydraulics, V90 pitch hydraulics, and SCADA. Additionally, a staff member involved in operations will take a safety course and all new personnel will be trained in specific skillsets required to carry out the Monitoring Plan.</p> <p>Furthermore, scheduled maintenance will allow for preventative procedures and unscheduled maintenance will be performed promptly, as and when necessary, to keep and maintain the plant in good working order. The location of the monitoring systems is provided in the CDM project project documents. The CDM II report also states that “Collected data on the measurement at the SMC point will be cross-checked against the backup measurement and electricity sales receipts and the values of electricity generation data published in OC Reports at the end of the year... The measurements at the 34.5 kV lines, used to determine the proportion of Los Cocos II electricity generation, will be cross checked with the backup measurement...”</p> <p>A computer system will continuously record, monitor and integrate the data, on a 15-minute interval. This data will be maintained by the Regulatory Office of the company headquarters in Santo Domingo (12 LC II CDM PDD p.56). In addition the Monitoring Plan will be implemented over 7-year crediting periods of the project. All data and evidence collected as part of monitoring will be archived electronically and be kept for at least for 2 years after the end of the last crediting period.</p> <p><u>Source:</u> 12 Los Cocos II CDM Project Design Document pages 12, 56,58, 74</p>	<p>*Records of improving adjustments in operation in response to energy production data</p> <p>*An analysis of how the monitoring process will result in a level of operation that exceeds industry standards</p>
<p><b>RA3.1 Protect Fresh Water Availability</b></p>	<p>0</p>	<p><b>No Score</b></p> <p>According to Sercitec’s Environmental Impact Assessment , the construction process will result in soil erosion which will contribute to water pollution via runoff. Since this will only happen during the construction phase, the magnitude will decrease over time and the significance of the impact has been judged to be moderate. No additional documentation has been provided to explain any measures to mitigate the pollution caused by soil erosion during the construction process.</p> <p>Sercitec’s Environmental Mitigation and Management Program recommends that containers used for the storage of waste must have fitted caps that prevent garbage from overflowing and rainwater from entering. This will also prevent the sun from accelerating the decomposition of waste, the generation of odors and the proliferation of flies. However, no documentation was provided to prove that comprehensive assessment of the project's long-term impacts on water availability. Nor is there any confirmation that the project will limit itself to the use water that can be replenished in both quality and quantity.</p>	<p>*Documentation explaining the measures to mitigate the pollution caused by soil erosion during the construction process.</p> <p>*Documentation proving that comprehensive assessment of the project's long-term impacts on water availability was conducted.</p> <p>*Documentation confirming that the project will limit itself</p>

		<u>Source:</u> 12_Declaración de Impacto Ambiental Los Cocos pages 83-111	to the use water that can be replenished in both quality and quantity.
<b>RA3.2 Reduce Potable Water Consumption</b>	0	<b>No Score</b>	*Completion and documentation of a feasibility and cost analyses to determine the most effective methods for potable water reduction and its incorporation of them into the design *Documentation of successful efforts to reduce potable water consumption
		The data documentation sheet states that the project team will neither conduct feasibility nor cost analyses to determine the most effective methods for potable water reduction and incorporate them into the design, nor will the project reduce potable water consumption. No documentation has been provided to confirm or deny this.  <u>Source:</u>	
<b>RA3.3 Monitor Water Systems</b>	0	<b>No Score</b>	*Completion and documentation of commissioning/monitoring of the project's water systems conducted by an independent party. *Inclusion and documentation of means to monitor water performance during operations Implementation and documentation of integrated long-term operations monitoring to mitigate or address leaks and improve efficiency.
		The data documentation sheet states that the project team will not conduct independent commissioning/monitoring of the project's water systems in order to validate the design objectives. Moreover, the project design will not include means to monitor water performance during operations or integrate long-term operations monitoring to mitigate or address leaks and improve efficiency. No documentation has been provided to confirm or deny this.  <u>Source:</u>	
<b>RA0.0 Innovate Or Exceed Credit Requirements</b>	0	N/A	
	50		



NATURAL WORLD			
	LOS COCOS WINDFARM. DOMINICAN REPUBLIC		RECOMMENDATIONS
NW1.1 Preserve Prime Habitat	9	<p><b>Superior</b></p> <p>According to both CDM reports and the two environmental impact studies conducted by Sertec the project’s construction will produce a moderate impact on the available habitats for local fauna. According to the Energy production assessment Conducted by Garrad Hassan The site consists mostly of irrigated farmland. Non-agricultural portions of land were covered by low shrubs. The cleared greenery is considered an area of low impact and importance based on the area’s low stratification in comparison to areas with higher trees and a wider range of plant growth.</p> <p><u>Source:</u> 12 DIA-PMAA Parque Eólico Los Cocos.pdf Section 3.2.2: Componente Biótico, 12 DIA-PMAA Parque Eólico Los Cocos.pdf Section 4.3.4.9, 12 estudio Ornitofauna 50499 Informe Estudio Aves 090928 REV3. PDF, 12 Estudio Ornitofauna.50499 Informe Estudio Aves 090928 REV3.pdf, 12 Los Cocos I CDM Project Design Document.pdf, 12 Los Cocos II CDM Project Design Document.pdf</p>	<p>*The Establishment of natural buffer zone of at least 91.44 meters around the windfarm would result in higher rating</p> <p>*An augmentation the total area of prime habitat space in the region</p> <p>*An improvement of habitat connectivity by linking habitats</p>
		<p><b>Improved</b></p> <p>The project site is on an elevated ridge that consisted of low lying shrubs and farmland, and avoids any contact with local wetlands. The data documentation sheet states that the project team will not maintain vegetation and soil protection zones (VSPV) around all wetlands, shorelines, and water bodies. establish a buffer zone or soil protection zone, nor will they restore degraded existing buffer zones to a natural state. No documentation has been provide to confirm or deny this claim.</p> <p><u>Source:</u> Energy Production Assessment of Juancho Los Cocos page 116</p>	
NW1.2 Preserve Wetlands and Surface Water	1	<p><b>No Score</b></p> <p>While the altered farmland has not been declared unique or of statewide importance some by Sercitec or Garrad Hassan, some interviewed members of the community have complained that the project has altered one of the best farm sites in Juancho (DIA-PMAA p.64)</p> <p><u>Source:</u> 12 DIA-PMAA Parque Eólico Los Cocos.pdf pages 21,27, 28, 64</p>	<p>*Establishment of 95% of site land as a Vegetation and Soil Protection Zone where no more than 10% of the VSDZ has development on it</p>
		<p><b>Conserving</b></p> <p>A study by Geoconsult S.A. revealed that the site itself is free of sinkholes, though there is one offsite in Charco Colorado characterized by limestone Karst dissolution. The study also provides a map showing the location of two faults about, with sinking rocks on one side of a fault line. The faults are not in the vicinity of project area and lie about 15 km from the site</p> <p>A study conducted by Laboratoria de Ingenieria concluded that the site will not infringe upon the groundwater level. Rather, the soils in the area are highly porous and will allow for easy permeability during periods of heavy rain. A study conducted by EPSA-LABCO, Ingenieros Consultores confirms that the site avoids overlap with the water table; any seepage from above is either blocked or slowed down by a clay layer underlying the top soils. EPSA-LABCO also concluded that the site is free of Karst.</p>	
NW1.3 Preserve Prime Farmland	0		
NW1.4 Avoid Adverse Geology	5		

		<p><u>Source:</u> 12 Estudio Geotecnico Parque Eolico Juancho-Los Cocos pages 30-51, 12 Estudio Geotecnico Sub. Estacion Los Cocos, 12 Informe Final Geotecnico Parque Eolico Los Cocos General pages 1, 2, 3, 4.</p>	
<p><b>NW1.5 Preserve Floodplain Functions</b></p>	<p><b>2</b></p>	<p><b>Improved</b></p> <p>The project avoids development on any local floodplains since the farm will be built on land that was previously classified as shrubby or agrarian. According to Sercitec’s assessment the completed project will not produce a significant alteration to local drainage patterns.</p>	<p>*Execution and documentation of a plan to maintain soil at pre-construction filtration levels *Completion and documentation of a design that will incorporate a flood emergency operations and/or evacuation plan *Execution and documentation of a plan to maintain or enhance riparian and aquatic habitat, including aquatic habitat connectivity. *Execution and documentation of successful efforts to modify or remove infrastructure subject to frequent damage by floods.</p>
		<p><u>Source:</u> Energy production assessment of the Juancho Los Cocos page II6, 12 DIA-PMAA Parque Eólico Los Cocos.pdf page 17</p>	
<p><b>NW1.6 Avoid Unsuitable Development on Steep Slopes</b></p>	<p><b>6</b></p>	<p><b>Conserving</b></p> <p>According to the study conducted by Geoconsult, the wind farm rests on a relatively flat area that slopes southward at 1.5%, increasing in elevation from 3.048 to 10.668 meters above sea level (12 EGPE J-LC p.45) . EPSA-LABCO has also concluded that the site has a liquefaction potential of zero (12 IFG PELCG p.59). As referenced In the previous credits the site is mostly well-permeated, allowing the vegetation layer to help mitigate any possible erosion in the area. The site location was selected primarily for profitability because it lies in one of the windiest parts of the Dominican Republic.</p>	<p>*Execution and Documentation of successful efforts to reduce or mitigate any disturbances on the slope.</p>
		<p><u>Source:</u> 12 Estudio Geotecnico Parque Eolico Juancho-Los Cocos page 45, 12 Estudio Geotecnico Sub. Estacion Los Cocos, 12 Informe Final Geotecnico Parque Eolico Los Cocos General page 59, 12 Los Cocos I CDM Project Design Document page 6</p>	
<p><b>NW1.7 Preserve Greenfields</b></p>	<p><b>0</b></p>	<p><b>No Score</b></p> <p>The site will not utilize any greyfield or brownfield sites. It will take the place of a greenfield site that has been assigned a low ecological value due to its low complexity as compared to forest. According to the environmental impact study, the supply of habitat in a given area increases with the complexity of the vegetation cover, being much greater in a forest (with stratification that includes herbs, shrubs, trees, vines and epiphytes) and lowest in an area of little stratification, as it corresponds to area to intervene for the project (DIA-PMAAPELC p. 84). Documentation does not state if efforts were made to avoid developing a greenfield site.</p>	<p>*Documentation showing that the team has considered how the project can conserve undeveloped land *Development of facilities on previously developed sites or brownfields</p>
		<p><u>Source:</u> 12 DIA-PMAA Parque Eólico Los Cocos.pdf Section 3.2.2: and Section 4.3.4.9</p>	

<p><b>NW2.1 Manage Stormwater</b></p>	<p>0</p>	<p><b>No Score</b></p> <p>According to the data documentation sheet, the project has not been designed to restore stormwater runoff, nor has it lead to an improvement in water storage capacity. However, the completed project will not produce a significant alteration to local drainage patterns.</p> <p>During construction stormwater management measures were taken such as constantly revising drainage works for sediments in order to avoid clogging in ditches, perimeter channels and rainwater processing systems (DIA-PMAAPELC, p. 106, 109).</p> <p><u>Source:</u> 12 DIA-PMAA Parque Eólico Los Cocos.pdf Section page 17</p>	<p>*Execution and documentation of a project design to reduce stormwater runoff to pre-development conditions.</p> <p>*Documented improvement of water storage capacity by at least 10%</p>
<p><b>NW2.2 Reduce Pesticides and Fertilizer Impacts</b></p>	<p>0</p>	<p><b>No Score</b></p> <p>According to the data documentation sheet the project will not implement policies to control and reduce the application of fertilizers, nor will it reserve appropriated landscaping plants to minimize the use of pesticides and fertilizers. The project team will also not select fertilizers and pesticides based on low toxicity. No documentation has been provided to confirm or deny this claim.</p> <p><u>Source:</u></p>	<p>*Implementation and documentation of policies to control and reduce the application of fertilizers</p> <p>*Documented use of appropriated landscaping plants to minimize the use of pesticides and fertilizers</p> <p>*Documented selection of fertilizers and pesticides based on low toxicity</p>
<p><b>NW2.3 Prevent Surface and Groundwater Contamination</b></p>	<p>1</p>	<p><b>Improved</b></p> <p>The project will not conduct or acquire hydrological delineation studies. However, a detailed Spill Prevention Plan primarily based on precautionary measures has been provided. A spill team will be responsible for regularly circulating and inspecting the locations of spills, investigating potential spills, and monitoring the integrity of the pipe systems. The guidelines require proper sealing of containers containing caustic or oily materials, clutter prevention, and a detailed protocol for the disposal of empty containers. Shower and eyewash stations must be made available to the staff in order to prevent the health effects of on-site leaks.</p> <p><u>Source:</u> 12 Programa de manejo B-P06.I01 Prevención de Derrames, 12 Los Cocos II CDM Project Design Document.pdf</p>	<p>*Incorporation of an analysis of groundwater quality in the monitoring of the pipe systems</p> <p>*Conduction and documentation of hydrologic delineation studies</p>

<p><b>NW3.1 Preserve Species Biodiversity</b></p>	<p>16</p>	<p><b>Restorative</b></p> <p>Efforts are made to preserve species biodiversity by reinstating appropriate vegetation through the Management Program of Fauna and Flora (PMFF) that is aimed at controlling the negative impact on birds in the project area during the operation stage. As part of the PMFF, a land use control plan will be designed to provide site areas with vegetation that is not attractive to birds in order to reduce the risk of collisions (DIA-PMAA-PELC, p. 151).</p> <p>According to Sercitec, the project comprises three habitat zones: the dry forest, the wet forest and the montane forest. The Avifaunal Study has identified 50 species of birds belonging to 13 orders, and 26 family associations of birds (Estudio Ornitofauna.50499 Informe Estudio Aves 090928 REV3 page 1). In addition, the general Environmental Impact Study identified one threatened bird species, Corvus palmarum (DIA-PMAA Parque Eólico Los Cocos page 49). This study also found that the most abundant bird species are the Bubulcus ibis and the Tiaris olive. Both are considered common and are not classified as rare or endangered (DIA-PMAA PLC p. 55).</p> <p>Since wind farms such as the one located in Altamont Pass, California have increased bird deaths resulting from collisions with turbines, greater focus has been placed on studying the potential impacts of the project on the local avifauna. The Sercitec Avifaunal Study found that 70% of the identified bird species can fly at the height of the range of action of the wind turbines and their blades, while the remaining 30% of species are either aquatic or fly below 40 meters. The average flight altitude of local birds is 15.6 meters with a range of 1 to 60 meters. However, most birds will fly outside of the collision zone: only 5% of the bird population flies above 35 meters and below 125 meters. In addition, Sercitec predicts that collision concerns will decrease with time based on a study of a wind farm in Tjaereborg, Denmark. The study found a low risk of collision in migratory species since they tend to change their flight route 100 to 200 meters before reaching the turbine, suggesting that birds adapt to the presence of turbines by modifying their habits over time ( EO.50499 IEA 090928 REV3 page 16). While the Environmental Impact Assessment has not found any evidence confirming that turbines lie in the routes of major migratory species, it has been noted that there are no maps that provide concrete data on the exact routes taken by birds every year. The site should undergo frequent avifaunal investigations to confirm that the lasting impact on the local bird population remains minimal.</p> <p><u>Source:</u> 12 DIA-PMAA Parque Eólico Los Cocos page 49, 12 Estudio Ornitofauna.50499 Informe Estudio Aves 090928 REV3</p>	<p>*Implementaion and documentation of successful efforts to increase the quality or quantity of existing habitat and wildlife movement corridors *Documentation of follow up Avifaunal studies that confirm the minimal impact on the local bird population</p>
<p><b>NW 3.2 Control Invasive Species</b></p>	<p>0</p>	<p><b>No Score</b></p> <p>According to the data documentation sheet, the project team is neither intending to specify locally- appropriate and non-invasive species for the site, nor is it implementing a comprehensive management plan to identify, control, and/or eliminate invasive species. No documentation was provided to confirm or deny this claim.</p> <p><u>Source:</u></p>	<p>*Implementation and documentation of a comprehensive management plan to identify, control, and/or eliminate invasive species</p>
<p><b>NW3.3 Restore Disturbed Soils</b></p>	<p>0</p>	<p><b>No Score</b></p> <p>According to the Data documentation sheet, close to 100% of removed soil was reused for road conditioning on the same project site No documentation was provided to confirm or deny this claim.</p> <p><u>Source:</u></p>	<p>*Documentation (photo or written) confirming the reuse of removed soil in soil conditioning.</p>

NW3.4 Maintain wetland and surface water functions.	0	<b>No Score</b>	*Execution and Documentation of successful efforts to maintain or enhance hydrologic connection *Execution and Documentation of successful efforts to enhance water quality *Execution and Documentation of successful efforts to enhance habitat *Execution and Documentation of successful efforts to maintain or restore sediment transport
		While the data documentation sheet claims that the project will not disturb the water quality in the area, there is no specific documentation to support this claim.  <u>Source:</u>	
	0	N/A	
<b>40</b>			

CLIMATE AND RISK			
	LOS COCOS WINDFARM. DOMINICAN REPUBLIC		RECOMMENDATIONS
CR1.1 Reduce Greenhouse Gas Emissions	13	<b>Superior</b>	*Execution and Documentation of a life-cycle GHG assessment *Execution and Documentation of successful efforts to sequester carbon
		The project reduces of Greenhouse gas emissions because it provides clean energy through wind power. Based on projections derived from plant activity in the year 2011 the wind farm is expected to reduce 112,489 tonnes of carbon emissions annually by displacing the consumption of polluting and energy sources (2 LC II CDM PDDD p.2, 42). Additionally the success of this project would both diversify the national energy matrix and encourage future attempts at building wind farms in the Dominican Republic. Given this information, the project is in the position to receive a score of conserving (18 points). However this category also requires a comprehensive life cycle carbon assessment. Since no documentation has been provided to confirm or deny the execution of a life-cycle GHG assessment the project will be awarded a score of enhanced (13 points).  <u>Source:</u> *12 Los Cocos II CDM Project Design Document.pdf pages 2, 42	
CR1.2 Reduce Air Pollutant Emissions	12	<b>Conserving</b>	
		The project will result in a negligible or nonexistent impact on the local air quality as wind power uses the kinetic energy of wind rather than the burning of fossil fuel to generate energy (12 Los Cocos II CDM Project Design Document.pdf page 2). Thus, the wind farm will not produce pollutants like sulfur dioxide, nitrogen oxides and particulate matter. The project will also result in a reduction of air pollution emissions by displacing the demand for energy derived from fossil fuels.  <u>Source:</u> 12 Los Cocos II CDM Project Design Document.pdf page 2	
CR2.1 Assess Climate Threat	0	<b>No Score</b>	*Documentation of a plan to address other relevant consequences of climate change such as altered weather patterns which may
		The project team has provided a comprehensive response plan in the case of a hurricanes, the magnitude and duration of which would be impacted by an increase in air and water temperature as a result of climate change. However, no plans have been provided that address other relevant consequences of climate change such as altered weather patterns which may result in weaker	

		or stronger winds.	result in weaker or stronger winds.
		<u>Source:</u>	
<b>CR2.2 Avoid Traps And Vulnerabilities</b>	2	<b>Improved</b>	*Augmented wind assessment that takes into account future changes in wind patterns that may result from climate change.
		The wind farm will help to augment and diversify the national energy matrix. This is of particular importance because of the Dominican Republic's strong dependence on fossil fuels and the occurrence of power outages resulting from low energy supplies.	
		The project site was chosen for its wind capacity due to its elevation and proximity to the coastline. A detailed assessment of the wind capacity was conducted from 2009 to 2012, which informed the placement of the specific wind turbines (12 LC II CDM PDDD p.6). However, the assessment was only done for a three-year period and does not necessarily take into account future changes in wind patterns that may result from climate change. The wind farm's sustainability depends largely on the persistence of wind; if winds were to strengthen or weaken to the point that they exceed or fall far below the plant's capacity, the plant would cease to be a reliable source of energy.	
		<u>Source:</u> 12 Los Cocos II CDM Project Design Document.pdf page 6	
<b>CR2.3 Prepare For Long-Term Adaptability</b>	0	<b>No Score</b>	*Execution and documentation of a project design that accommodates a changing climatic environment throughout the project's lifespan
		The data documentation sheet states that the project will not be designed to accommodate a changing climatic environment throughout the project's lifespan. No documentation has been provided to confirm or deny this.	
		<u>Source:</u>	
<b>CR2.4 Prepare For Short-Term Hazards</b>	3	<b>Improved</b>	
		The project team has provided response and prevention plans for hurricanes, earthquakes, and spills along with a protocol for responses to environmental emergencies. The Hurricane Response Plan is divided into three parts: preparation for oncoming hurricane, evacuation and safety during the hurricane, and damage mitigation and reconstruction after the hurricane. These natural hazards are likely to happen within 25 years. The Earthquake Response Plan is organized in the same way but with the responses based on ranges along the Richter scale.	
		<u>Source:</u> 12 Los Cocos II CDM Project Design Document.pdf page 70	
<b>CR2.5 Manage Heat Island Effects</b>	0	<b>No Score</b>	*Drawings showing all non-roof non-vegetated areas of the site and the surfacing material. *Calculations demonstrating at least 10%, 30%, 60%, or 90% of the hardscape project area meets the requirements.
		The heat island effect is caused by concrete, asphalt, and building walls absorbing and then later emitting the shortwave radiation of the sun.resulting in an increase in temperature in areas with a lot pavers. The wind farm will not take place in a paved urban setting, nor is the majority of the farm covered in paving material, the farm is a rural field planted with low lying plants. The project will not produce a head island effect nor does it have the potential to do so thus the credit its not applicable.	
		<u>Source:</u>	
<b>CR0.0 Innovate Or Exceed Credit Requirements</b>	0	N/A	
	<b>30</b>		

<b>OVERALL:</b>	<b>261</b>	<b>LOS COCOS WINDFARM. DOMINICAN REPUBLIC</b>
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## APPENDIX D: SOURCES

DOCUMENTATION PROVIDED.
General Information.
Wind farm, Los Cocos. Dominican Republic
18 11 11 Acta Puesta en Posesion Dec 326 11
12 Annex 10 1 Power Curve Warranty Gamesa
12 B P06 Preparación y Respuestas ante Emergencias Ambientales
Community Development Los Cocos 2011. spanish
12 Declaración de Impacto Ambiental Los Cocos
Definitive Land Use Agreement
12 DIA PMAA Parque Eólico Los Cocos
Energy production assessment of the Juancho Los Cocos II
12 Estudio Geotecnico Parque Eolico Juancho Los Cocos
12 Estudio Geotecnico Sub. Estacion Los Cocos
12 Estudio Ornitofauna.50499 Informe Estudio Aves 090928 REV3
Gamesa 2012 resumen informe sostenibilidad eng
03 Informe 2da quincena de Febrero del 2012 Ampliación Los Cocos
12 Informe Final Geotecnico Parque Eolico Los Cocos General (Linea 1, 2, 3 y 4)
12 Los Cocos I CDM Project Design Document
12 Los Cocos II CDM Project Design Document
12 Los Cocos Libro de Mesa Digital
12 Los Cocos Phase II EPC Agreement (30 Dec 2011)
12 Los Cocos Phase II EPC Agreement (30 Dec 2011)
12 memoria 2011 Responsabilidad Social
12 Memoria 2012 Responsabilidad Social
PLANO DE CIMENTACIONES, PLATAFORMAS Y VIALES
12 Plan de Huracanes Rev 1.3
PMAA completo
12 Procurement Summary Draft

12 Programa de manejo.B P06.I01 Prevención de Derrames  
12 Programa de manejo.B P06.I03 Clasificación de Eventos  
12 Programa de manejo.B P06.I04 Ejercicios de Emergencia  
12 Respuesta Terremotos.S R01 F02 Ficha de Plan General  
12 Respuesta Terremotos.S R01 F03 Ficha de Emergencias  
12 Resumen Requisitos Licitaciones (drft)  
12 Ruido.1012 AmbNoiseMeas EGE Haina 1012OR01a 20110822 JM  
12 Ruido.1012 NIA EGE Haina 1012OR02a 20110822 JM  
12 Ruido.ANEXO 3.1 INFORME CALIDAD AMBIENTAL  
12 S R01 I02 Plan de Respuesta a Terremotos  
Site Plant Last Version  
Site Plant Original  
12 Suelos 01 S 1067  
Vestas Sustainability report 2010  
Thormann Peralta Security S.A. Invoice. January 2014.  
Records of the treasury of the social security  
07-05-13 Energía y Recursos Ambientales  
EGE Haina; B.O. Service & Availability Agreement  
LCII Service Availability Agreement