

CASE STUDY

PALMATIR WIND POWER PROJECT -URUGUAY



Figure 1: Assembly process of one of the turbines/ Source: Picture taken during onsite visit, May 2013

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1. INTRODUCTION

This case study outlines the evaluation of the Palmatir Wind Power project, also known as Wind Farm Peralta. The project is located in the Province of Tacuarembó, Uruguay, 12 km away from the municipality of Cuchilla de Peralta (population 300). The region's biggest populated area is Paso de los Toros, approximately 22 km south, with a population of 13,000 inhabitants.

The assessment methodology used as a framework to evaluate this project is the *Envision Rating System for Sustainable Infrastructure Version 2.0*¹, developed by the Zofnass Program at Harvard University.

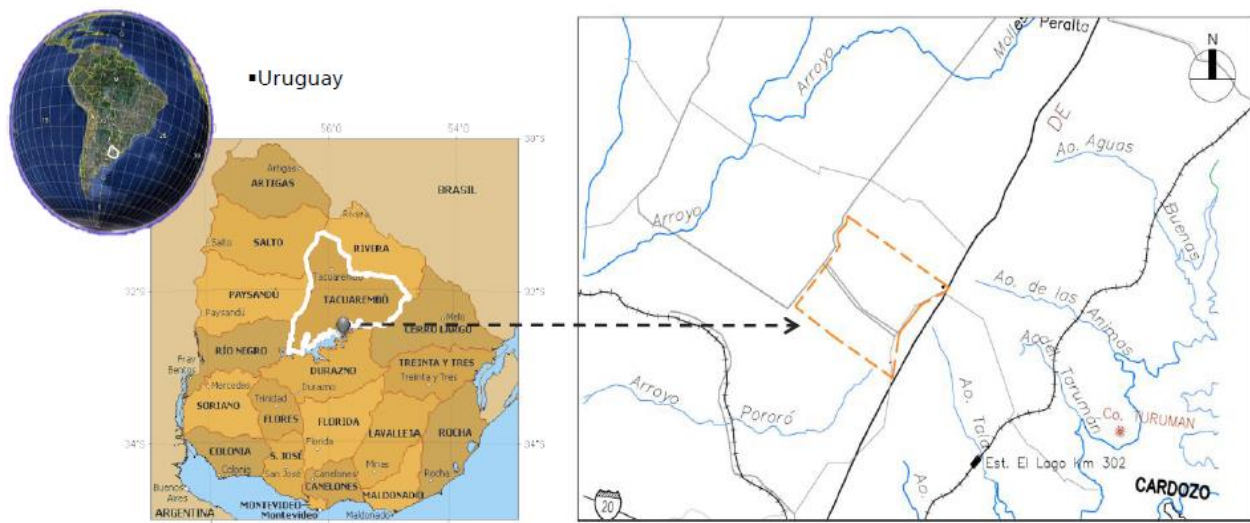


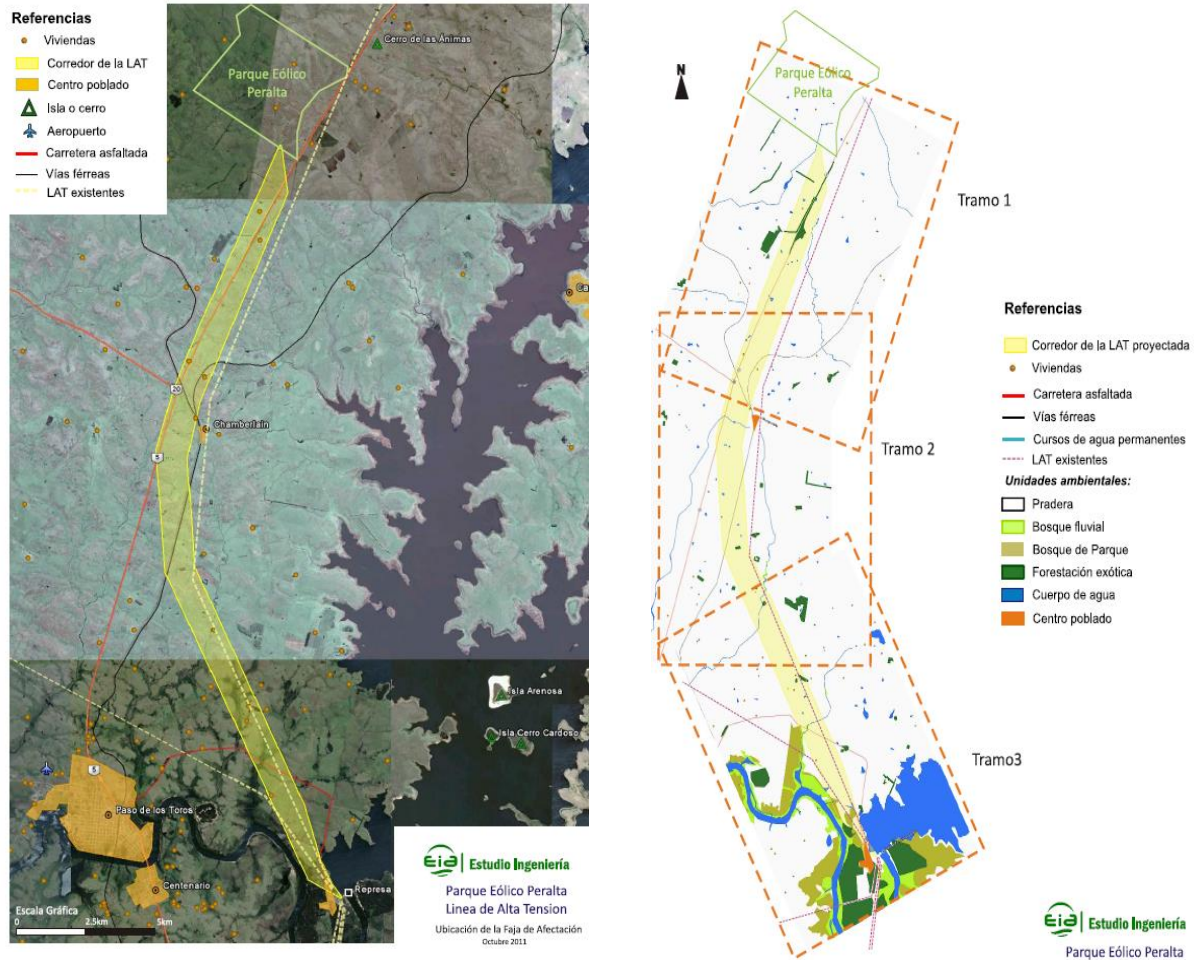
Figure 2: General map of the location of the project/ Source: Public Hearing Document 09_31_2011

At the moment, Uruguay has an energy matrix that relies almost entirely on energy from hydroelectric power plants, representing up to 73% of its annual demand. The remaining 27% of the yearly annual consumption is produced almost totally in thermoelectric plants that run on imported fossil fuels. In this context, Wind Farm Peralta is important not only because it will contribute to produce clean energy for Uruguay, but also because it will help to diversify the country's energy matrix and, increasing its resilience.

Wind Farm Peralta – under construction in July 2013 – is being developed by PALMATIR S.A. This company will sell the energy produced at the aeolic energy plant to the National Administration of Power Stations and Transmission Lines (Administración Nacional de Usinas y Transmisiones Eléctricas - UTE).

¹ This study uses *Envision* as a framework to rate Wind Farm Peralta Project. The *Envision* system has been developed by the Zofnass Program at Harvard University, in collaboration with the Institute of Sustainable Infrastructure (ISI). *Envision* is available online for public use. However, this case study does not constitute an official certification or rating. The ISI as an organization oversees the official verification process in the United States for US infrastructure projects.

The project consists of 25 turbines that deliver a total installed capacity of 50 MW. The energy produced at the Wind Farm will be transported to the national grid through a High Tension Line (LAT or Línea de Alta Tensión). PALMATIR will also construct this LAT. Both Wind Farm Peralta and the new LAT are part of the scope of this evaluation.



Figures 3,4: General map of the windfarm and the distribution line / Source: Preliminary Environmental Assessment LAT page 5, 19

Several assessments were made in the process of licensing Wind Farm Peralta and the LAT. One of such was an Environmental Impact Assessment made for the energy plant in July 2011². This first assessment was then modified and completed on October 2011³ in response to observations made by the Uruguayan National Environmental Direction. A separate Preliminary Assessment was made for the LAT.⁴ Public hearings⁵ and an Environmental Management Plan⁶, among others, complemented these studies of Wind Farm Peralta. The evaluation of each credit in the present case study will be based on the Assessments and Plans aforementioned.

² ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011.

³ ATT6AIOG Palmatir S.A, Modification of the environmental impact study installation of a wind farm in Peralta, Tacuarembó Department, October 11, 2011.

⁴ ATT3S5PL Palmatir S.A: Wind farm Peralta - High Voltage, Preliminary Environmental Assessment LAT line Peralta, Tacuarembó Department, October 11, 2010

⁵ ATTUO3XM document prior to public hearing, "Wind park Peralta I" 14 October 2011

⁶ Environmental Management Plan (PGA), Windfarm Peralta and line, UTE Inabensa Teyma Peralta 08_12

2. BACKGROUND AND PROJECT DEVELOPMENT

Palmatir divided the overall execution of the project into several components:

- a) Installation of 25 wind turbines, with a nominal capacity of 2MW each;
- b) Execution of a transmission line to transport the energy from the Wind Farm to the national grid, with total length being approximately 34 km above ground and 20 km of subterranean cables (both for electricity and telecommunications);
- c) Execution of the substation;
- d) and construction and maintenance of around 17km new roads and existing ones.

Palmatir S.A. was created to drive the construction and operation of the project. This company has estimated the total cost of the project to be US \$ 143.8 Million, divided mainly in US \$ 116.5 Million for the turbines, US \$ 7 Million for the High Tension Line, and the rest distributed among the other components listed above.

From the total investment, funding derives approximately 27% from equity capital and 73% from long-term loans from the Inter-American Development Bank (IDB) and U.S. Exim Bank.

Documentation from Palmatir confirms that this project follows the guidelines for Clean Development Mechanisms (CDM), defined in Article 12 of the Kyoto Protocol. This will allow the sale of Certified Emissions Reductions (CERs) once the operation begins. The carbon credits are one of the important source of financial support that will guarantee the financial viability of the Wind Farm. The facility is estimated to generate about 100,000 CERs per year, a reduction equivalent to 100,000 tons of CO₂ yearly emitted into the atmosphere.

Estimated electricity production per year is 177,521 MWh, enough to attend the energy needs of approximately 74,000 inhabitants. UTE, the Uruguayan state-owned enterprise dedicated to the generation, transmission, and distribution of electricity, will buy the energy produced by Palmatir at an agreed price of 86.60 USD/MWh. The purchase agreement will be valid for the next 20 years.

Palmatir S.A. is a subsidiary of Abengoa, a multinational company based on Spain. Because of this, Palmatir follows the same policies with regard to its commitment to sustainably as its parent company. Specific processes of control have been implemented globally, such as the measurement of the greenhouse emissions related directly or indirectly to the operations of Abengoa and its subsidiaries. One of the main goals of this greenhouse gas inventory is to *“draw up annual reduction plans, label our products and services, and evaluate suppliers according to the GHG emissions associated with the products and services they provide.”*⁷ In terms of the project evaluation, this intense commitment was considered so innovative as to earn innovation credits on its *Envision* rating.

⁷ Greenhouse gas inventory: http://www.abengoa.es/web/en/gestion_responsable/principales_iniciativas/inventario_gases/

3. APPLICATION OF THE ENVISION RATING SYSTEM⁸

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 a wind power plant, designated Wind Farm Peralta. The main intent of this rating is to evaluate both the Wind Farm and the High Tension Line used to transport the energy produced in the turbines to the Uruguayan National Energy Network, managed by UTE.

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. *Envision* provides evaluation criteria to determine if the qualifications for each level of achievement have been met for any 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 ISI⁹ and Zofnass Program¹⁰ websites.

Appendix D provides a table with the detailed project assessment, specifications for each of the credits, and recommendations for the Wind Farm Peralta project.

4. DIFFERENT CATEGORIES TO EVALUATE

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*

⁸ Anthony Kane, Zofnass program research director, and Salmaan Khan, research assistant, wrote most parts of this section.

⁹ www.sustainableinfrastructure.org

¹⁰ www.zofnass.org

community goals, incorporated into existing community networks, and will benefit the community in the long term.”¹¹ 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).

1	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
			13	27	62	150	151

Figure 5: Quality of Life category credits distribution.

4.1.1. Purpose:

In the **Purpose subcategory**, Wind Farm Peralta has a good performance, with two credits evaluated as “Conserving” (QL1.1 Improve Community Quality of Life and QL1.3 Develop Local Skills and Capabilities) and one credit evaluated as “Superior” (QL1.2 Stimulate Sustainable Growth and Development).

Through several studies (including the EIA and an Environmental Management Plan), it was assessed that both the magnetic fields and the noise generated by the project are within the maximum allowable values. Community information and involvement in the project was made through public hearings where neighbors to the project had the chance to access project documents.

The community holds a favorable perception of the project because of the expected positive impacts to both the environment and the economy. Wind Farm Peralta is expected to produce renewable energy for almost 50,000 houses. Furthermore, because wind energy production is compatible with the current land uses in the region (mostly livestock breeding), Wind Farm Peralta opens up new perspectives to increase economic productivity in a sustainable way.

The project has a positive impact in terms of job generation for the community, especially in the construction phase, with around 100 people involved in the works. After the completion of the project, 4-6 persons will continue working on the wind farm during the project’s lifespan. It is specified in the Turbines Maintenance Contract that at least 80% of those employed in the maintenance process, must be from Uruguay.¹² This project is also important to the development of the area because it will contribute to local knowledge of Aeolic energy projects.

The Project area has quite a low population density; however, currently there are six houses within one kilometer of the project concession area. One of those houses is inside the boundaries of the windfarm and the rest are just outside the concession area (see **figures 6-9** on the next page).

¹¹ *Envision* Guidance Manual, p.30

¹² Turbines Maintenance Contract between Palmatir (owner) and Epartir (maintainer). February 15, 2013, clause 5 “subcontracting”.



Figure 6: “Caserío Cuchilla de Peralta” 12 km north from the windfarm
Source: Picture taken during the onsite visit May 2013



Figure 7: School where the public consultation was conducted
Source: Picture taken during the onsite visit May 2013



Figure 8: Surroundings of Caserío Cuchilla de Peralta
Source: Picture taken during the onsite visit May 2013



Figure 9: One of the houses inside the windfarm perimeter
Source: Picture taken during the onsite visit May 2013

4.1.2. Community:

In the **Community subcategory**, out of six credits, three were evaluated as “Conserving” (QL2.1 Enhance Public Health and Safety, QL2.2 Minimize Noise and Vibration, and QL2.4 Improve Community Mobility and Access), one was evaluated as “Enhanced” (QL2.6 Improve Site Accessibility, Safety and Wayfinding), and two were considered non-applicable to the analysis (QL2.3 Minimize Light Pollution and QL 2.5 Encourage Alternative Modes of Transportation).

Careful studies were conducted to assess possible impacts of the project on the health of the community and employees, including an evaluation of magnetic fields and the shadows projected by the towers and the turbines. Due to the impact of projected shadows found in one such evaluation, some of the generating units were relocated.¹³ For some of these studies, and in the absence of specific

¹³ ATT6AIOG Modification of the Environmental Impact Assessment for the installation of a wind farm in Peralta, Tacuarembó Department, October 11, 2011, chapter 2, pages 8 -11.

environmental legislation in the country, international standards were used as reference for the definition of acceptable levels.¹⁴

Regarding impacts from noise, the results were within maximum allowable values. “From the study of noise, it was determined that the maximum values in the vicinity of the houses did not exceed standards.”¹⁵ Due to the very low population density,¹⁶ disturbance to population is expected to be very low.

Palmatir improved community access and mobility through the construction of new roads as well as the improvement of existing ones. Putting up proper signage on the adjacent National Route 5, the region’s main road, has also been part of the works.

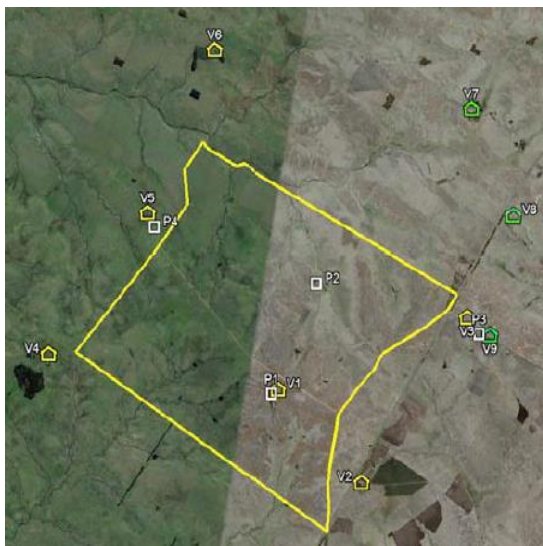


Figure 10: Noise monitoring points.
Source: Modification of the Environmental Impact Assessment, Figure 1-2, page 5.

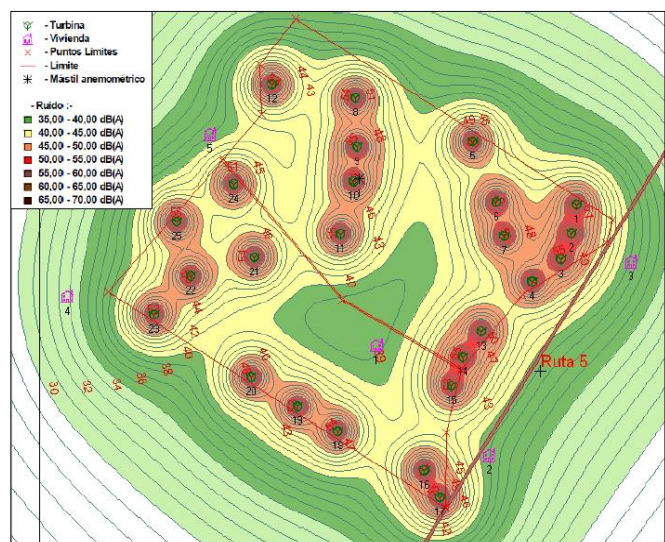


Figure 11: Evaluation of noise levels produced by the turbines.
Source: Modification of the Environmental Impact Assessment, Figure 2-2, page 13.

¹⁴ Recommendations from the Danish Wind Industry Association and sentences from various Court decisions in Europe are among the used references.

¹⁵ Brazilian Standard, CTESB L11.032 Report of request for national approval, Annex b, table 15, page 41

¹⁶ The population density of the Department of Tacuarembó is 1.04 inhab/km², making of this location one of the less populated areas in Uruguay. (ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011, Chapter 3, page 21).

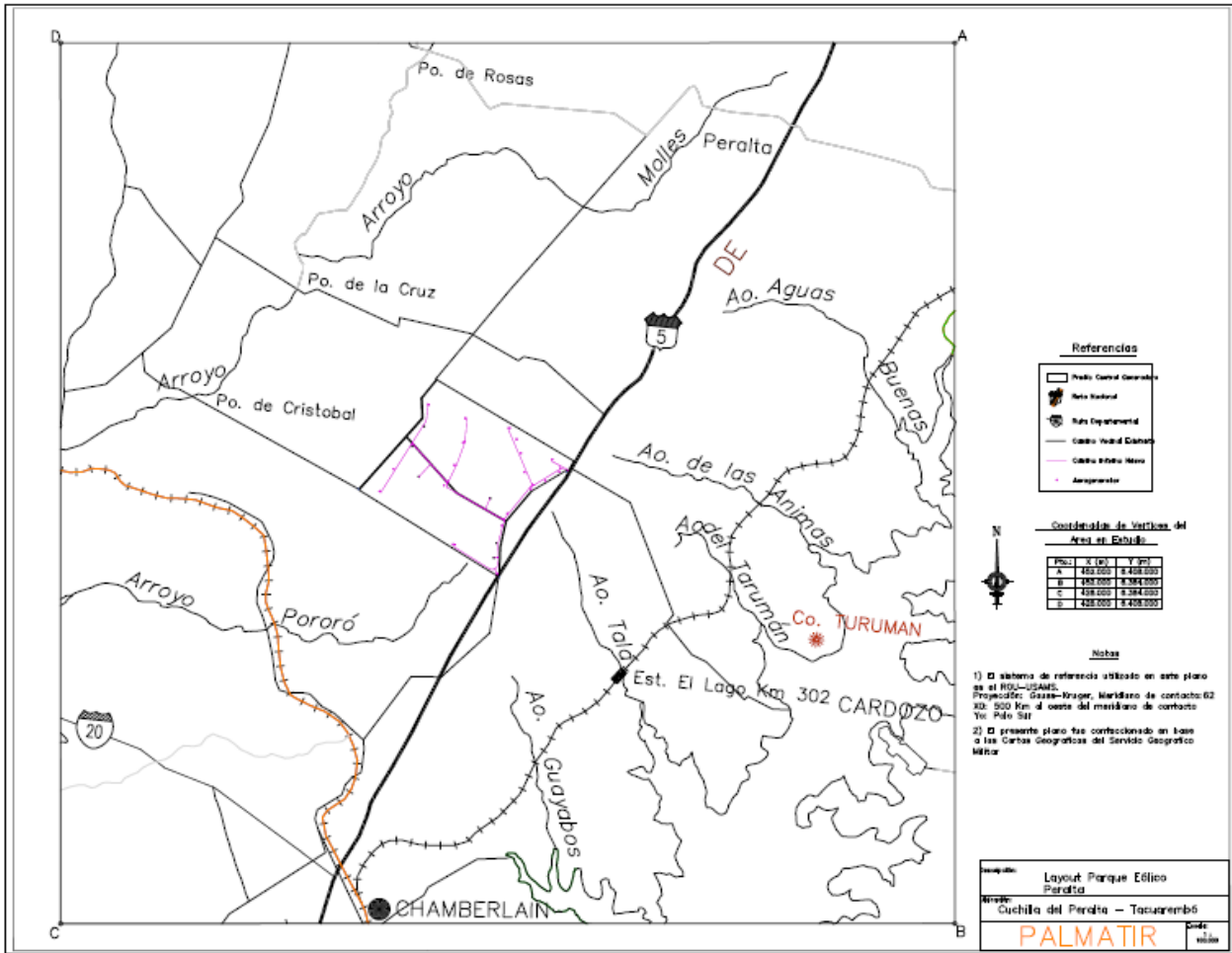


Figure 12: Highways and roads at wind Farm Peralta and surroundings / Source: Environmental Impact Assessment, access routes. page 28



Figure 13: Trucks transporting the pre-fabricated towers to the site, during construction process.
Source: Picture taken during the onsite visit May 2013

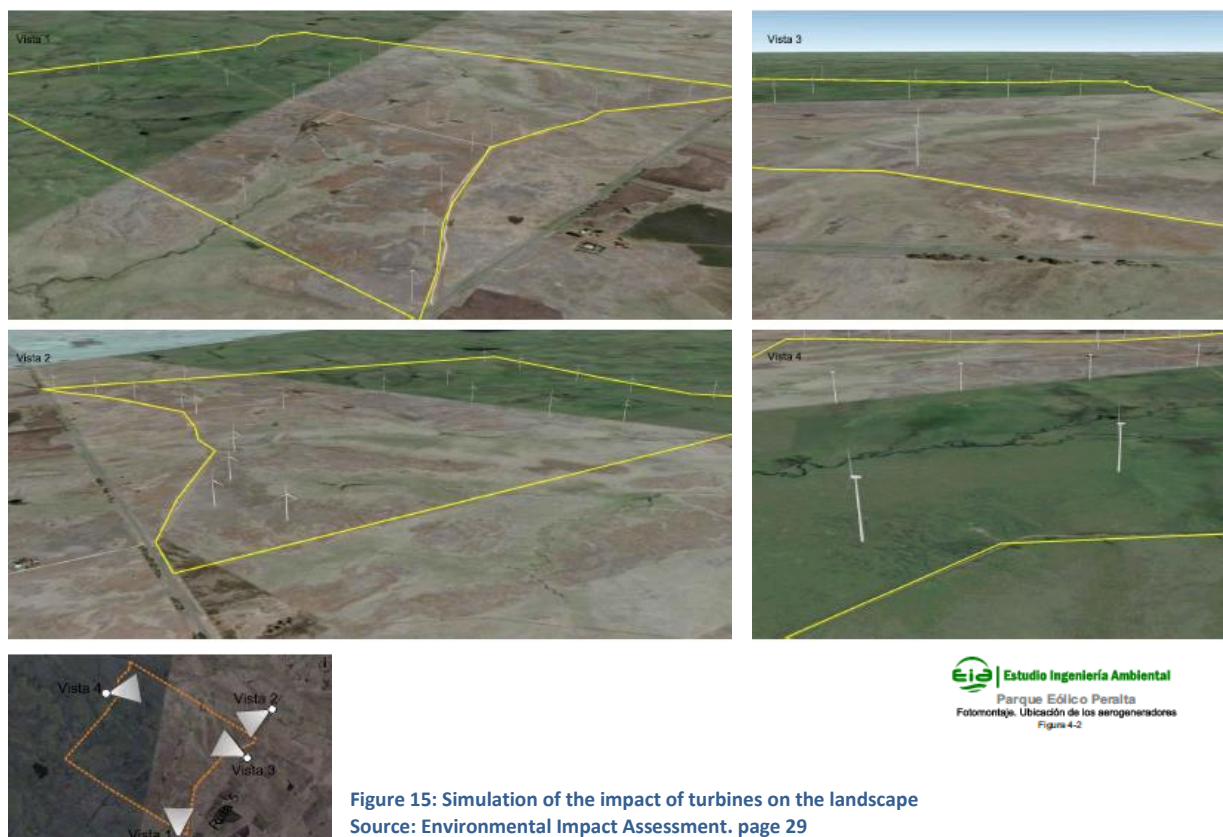


Figure 14: Trucks are using improved access roads.
Source: Picture taken during the onsite visit May 2013

4.1.3. Wellbeing:

In the **Wellbeing subcategory**, out of three credits, two were evaluated as “improved” (QL3.1 Preserve Historic Character and Cultural Resources and QL3.2 Preserve Views and Local Character) and one as “not achieving” (QL3.3 Enhance Public Space).

One of the most important impacts of this project is the alteration of the scenic qualities of the landscape. As specified in provided documentation,¹⁷ the physical presence of the LAT has a “medium” degree of significance to the landscape environment. Palmatir completed a detailed study on the “quality of the landscape”, or the perception of the turbines, which included a simulation of the actual location of the generators (see EIA, Chapter 4.3, map views 1 and 2). The project team took mitigation measures, such as painting the generators with a grey color, to minimize the visual impacts.



A place of historical interest was identified nearby to the project location, 5 kilometers north from the High Tension Line. Called “Cerro de las Ánimas” (“Hill of the Souls”), it is the site of an old cemetery from the 16th century. A protocol was thus established for the finding of archeologically significant objects on the construction site.

The project team provided no documentation regarding the creation or enhancement of public space.

¹⁷ Preliminary Environmental Assessment for the High Tension Line (LAT), page 17



Figure 16: Simulation of the impact of turbines on the landscape / Source: Environmental Impact Assessment, access routes. page 32

4.1.4. Non Applicable credits

There are two non-applicable credits in this category, “QL2.3 Minimize Light Pollution” and “QL2.5 Encourage Alternative Modes of Transportation.” In the first credit, it was assessed that the credit is non-applicable due to the fact that no light pollution will occur as a consequence of the construction of the turbines. Lighting will illuminate each tower according to safety regulations. In the second credit, the project team made no consideration to adding alternative transport. The main modes of transportation to the site are currently car or bus provided by Palmatir, through National Route 5. At this point, there is no information about the implementation of public transportation systems. During the operation phase, the number of people required to run the wind farm is expected to be low, around 6-8 people. During construction phase, several buses transport personnel from Paso de Toros, one of the main villages close to the park, to the construction site and back. Bus transportation for employees is also available at lunchtime.



Figure 17: Bus transporting construction personnel to the site. Source: Picture taken during the onsite visit May 2013



Figure 18: Bus transporting construction personnel to the site. Source: Picture taken during the onsite visit May 2013

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

The table below shows the distribution of credits as well as the level of achievement reached in each credit (figure 19).

PALMATIR WIND POWER PROJECT – URUGUAY			PT.	Performance	max.	
1 2 3 4 5 6 7 8 9 10 11 12	PURPOSE	QL1.1 Improve Community Quality of Life	20	Conserving	25	NA
		QL1.2 Stimulate Sustainable Growth & Development	5	Superior	16	
		QL1.3 Develop Local Skills And Capabilities	12	Conserving	15	
	COMMUNITY	QL2.1 Enhance Public Health And Safety	16	Conserving	16	
		QL2.2 Minimize Noise And Vibration	8	Conserving	11	
		QL2.3 Minimize Light Pollution	0	Not Applicable	0	
		QL2.4 Improve Community Mobility And Access	14	Conserving	14	
		QL2.5 Encourage Alternative Modes of Transportation	0	Not Applicable	0	
	WELLBEING	QL2.6 Improve Site Accessibility, Safety & Wayfinding	3	Enhanced	15	
		QL3.1 Preserve Historic And Cultural Resources	1	Improved	16	
		QL3.2 Preserve Views And Local Character	1	Improved	14	
		QL3.3 Enhance Public Space	0	Non Achieving	13	
QL0.0 Innovate Or Exceed Credit Requirements		0	Non Achieving		8	
QL		80			155	

Figure 19: Summary of results in Quality of life category

The biggest opportunities for improvement in Quality of Life (QL) for the project occur in the sub-category of Wellbeing. Considering all credits and the maximum possible values for each indicator, the percentage of achievement adds to 52%, or 80 points out of 155.

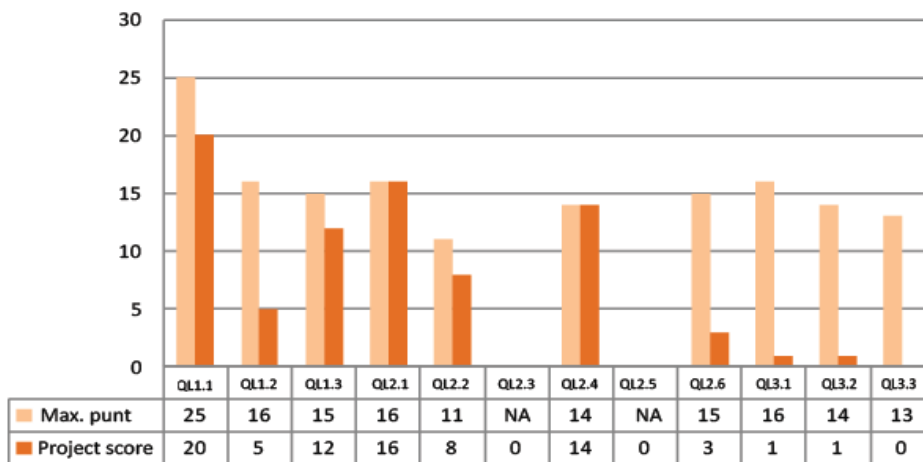


Figure 20: Summary of results in Quality of life category

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.”¹⁸

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).

TABLE OF POINT VALUES

			Improved	Enhanced	Superior	Conserving	Restorative
13	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	MNGMT.	LD2.1 Pursue by-product synergy opportunities	1	3	6	12	15
18		LD2.2 Improve infrastructure integration	1	3	7	13	16
19	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	
			10	31	56	115	31

Figure 21: Leadership category credits distribution.

4.2.1. Collaboration:

In the **Collaboration subcategory**, the results of the Wind Farm Peralta assessment present one credit as “Conserving” (LD1.4 Provide for Stakeholder Involvement), two as “Superior” (LD1.1 Provide Effective Leadership and Commitment and LD1.3 Foster Collaboration and Teamwork), and finally, one credit as “Enhanced” (LD1.2 Establish a Sustainability Management System).

The project fulfills the requirements of the Kyoto Protocol. All of the contractors involved in the construction process demonstrated a commitment to sustainability documented clearly in the Environmental Management Plan (or PGA by its acronym in Spanish). The PGA expresses intentions to foster a culture of collaboration during the execution of the project. Personnel are expected to work together in order to achieve goals of sustainability.

Regarding community involvement, the community attained detailed information through public hearings related with the EIA. E-mails, posters, advertisements in local stores, and radio announcements promoted the hearings.¹⁹

¹⁸ Envision Guidance Manual, p.60

¹⁹ Report of request for national approval, annex D chapter 3.4.1, page 21, hearing of CDM Peralta I and Peralta II projects.

4.2.2. Management:

In the **Management subcategory**, the Palmatir project evaluated as “non-achieving” in LD2.1 Pursue By-product Synergy Opportunities, and as “superior” in LD2.2 Improve Infrastructure Integration.

The concept of by-product synergy opportunities refers to “the identification and cost-effective use of unwanted materials located near the project.”²⁰ There is no data regarding any programs to use unwanted materials from nearby facilities. Regarding the improvement of infrastructural integration, Wind Farm Peralta has contributed in two ways. First, the new High Tension Line interconnects the turbines with the Uruguayan system of power distribution. Second, the construction of new roads and the improvement of existing ones has enhanced road connectivity.

4.2.3. Planning:

In the results of **Planning subcategory**, one credit was evaluated as “Conserving” (LD3.1 Plan for Long-term Monitoring and Maintenance), one was evaluated as “Improved” (LD3.3 Extend Useful Life) and one was considered to be non-applicable (LD3.2 Address Conflicting Regulations and Policies).

Palmatir developed maintenance plans for both construction and operation phases. A firm named EPATIR S.A. was hired to provide maintenance services to the Wind Farm for the next 20 years, the expected lifespan of the project.²¹ The project team has also contemplated the need to develop contingency plans to deal with situations of environmental risk. Such plans have been developed for construction and operation phases, and there are guidelines set for the decommissioning phase.

The expected useful life of Wind Farm could be extended over the initial assessment of 20 years, given proper conditions of maintenance. With a growing demand for the carbon credits created in conjunction with wind energy production, the economic incentives will make extending the life likely to happen given the available information at this point.



Figure 22: View of the state of paths before their improvement
Source: Picture taken during the onsite visit May 2013



Figure 23: Improvements of the paths within the windfarm
Source: Picture taken during the onsite visit May 2013

²⁰ *Envision* Guidance Manual, p.70

²¹ Turbines maintenance contract between Palmatir (owner) and Epartir (maintainer). February 15, 2013

4.2.4. Non applicable credits

The only credit non applicable in this category is LD3.2 Address Conflicting Regulations & Policies. No conflict of regulations and policies that prohibits the implementation of this project has been detected. National and/or international regulations have been applied according to the standards.

4.2.5. Summary of results for the Leadership category.

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

13	LEADERSHIP	COLLABORATION	LD1.1 Provide Effective Leadership And Commitment	9	Superior	17	NA
14			LD1.2 Establish A Sustainability Management System	4	Enhanced	14	
15			LD1.3 Foster Collaboration And Teamwork	8	Superior	15	
16			LD1.4 Provide For Stakeholder Involvement	14	Conserving	14	
17	MNGMT.	LD2.1 Pursue By-Product Synergy Opportunities	0	Non Achieving	15		
18		LD2.2 Improve Infrastructure Integration	7	Superior	16		
19	PLANNING	LD3.1 Plan For Long-Term Monitoring & Maintenance	10	Conserving	10		
20		LD3.2 Address Conflicting Regulations & Policies	0	Not Applicable	0		
21		LD3.3 Extend Useful Life	1	Improved	12		
		LD0.0 Innovate Or Exceed Credit Requirements	0	Non Achieving	8		
		LD	53		113		

Figure 24: Summary of results in Leadership category

The biggest opportunities for improvement in Leadership (LD) occur in the subcategories Management and Planning. Considering all credits and the maximum possible values for each indicator, the percentage of achievement adds to 47%, or 53 points out of 113.

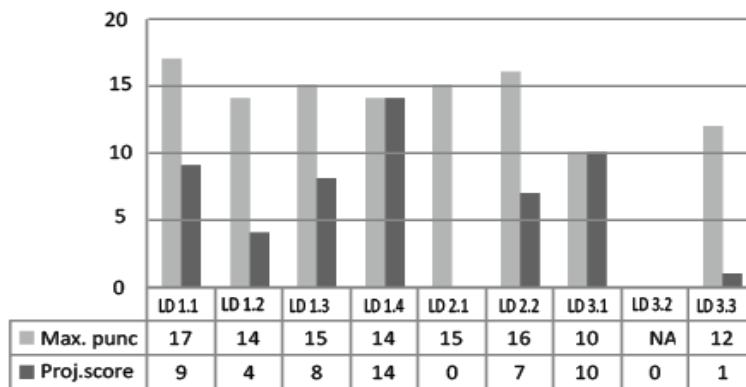


Figure 25: Summary of results in Leadership category

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).

TABLE OF POINT VALUES

			Improved	Enhanced	Superior	Conserving	Restorative
22	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	
			29	66	112	170	62

Figure 26: Resource Allocation category, credits distribution.

4.3.1. Materials:

In the **Materials subcategory**, out of seven credits, one was assessed as “Conserving” (RA1.6 Reduce Excavated Materials Taken Off Site), three were evaluated as “Superior” (RA1.2 Support Sustainable Procurement Practices, RA1.5 Divert Waste from Landfills, and RA1.7 Provide for Deconstruction and Recycling), one was evaluated as “Enhanced” (RA1.3 Use Recycled Materials), and one was assessed as “Improved” (RA1.4 Use Regional Materials). Finally, one credit received a non-achieving evaluation (RA1.1 Reduce Net Embodied Energy).



Figure 27: Reuse of excavated material.
Source: Picture taken during the onsite visit May 2013



Figure 28: Reuse of excavated material.
Source: Picture taken during the onsite visit May 2013



Figure 29: Reuse of excavated material.
Source: Picture taken during the onsite visit May 2013



Figure 30: Reuse of excavated material.
Source: Picture taken during the onsite visit May 2013



Figure 31: Recycling of the scrap steel from the construction site
Source: Picture taken during the onsite visit May 2013



Figure 32: Recycling of waste paper, cardboard, etc. Source:
Picture taken during the onsite visit May 2013

No data is available to prove that a life cycle or a net embodied energy assessment was performed in accordance with recognized and accepted methodologies. However, a strong evaluation of the project's suppliers was carried out. Adherence to the code of Social Responsibility outlined by Teyma is compulsory to be a subcontractor at Wind Farm Peralta. The code states that all activities will be developed in compliance with environmental regulations.²² Third parties subcontracted for the project are also obligated to sign the "Agreement for the implementation of a System of Greenhouse Gases Emission Reporting". "The supplier undertakes [the obligation] to implement a System of Greenhouse Gases Emission Reporting, hereinafter SEGEI [...]."²³

²² Environmental Management Plan (PGA), Windfarm Peralta and line, UTE Inabensa Teyma Peralta 08_12, Chapter 9.2, p 10.

²³ An "Agreement for the Implementation of a System of Emissions Reporting Greenhouse Gases" has been provided as an example of the format used by the suppliers. In it, suppliers must provide the following data: direct emissions, indirect emissions associated with the consumption of electricity and heat, indirect emissions associated with goods / services purchased by the provider to produce the goods / services for which it has contracted. As specified in this document, the deadline for implementing the SEGEI and provide the requested data is 6 months from the date of signing the agreement.

Several companies involved in the execution of the project have been certified by organizations such as ISO. Thus, in the Report of Request for National Approval we can read, *“Both the EPC (Engineering, Procurement and Construction) company and the turbine supplier have certifications in quality management ISO 9001, environmental management systems ISO 14001 and systems for the prevention of occupational hazards OHSAS 18001.”*²⁴

Many materials are being recycled or reused during the construction process; the two most relevant in volume are the soil excavated from the foundations and the steel bars used for the foundation of the towers. Soils have been used to repair the inner roads and fill the top of the foundations. Certain materials such as gravel, sand, steel, and cement were locally produced. The Environmental management plan has considered the measures needed to dispose properly of recyclable materials, during construction phase. Finally, regarding decommissioning, the EIA has established the actions necessary after the facility is closed in order to return the landscape to its original condition.

4.3.2. Energy:

In the **Energy subcategory**, out of three credits, one was assessed as “Restorative” (RA2.2 Use Renewable Energy), and one was evaluated as “Conserving” (RA2.3 Commission and Monitor Energy Systems). The third was considered not applicable to this project (RA2.1 Reduce Energy Consumption).

With 25 turbines and a total installed capacity of 50 MW, the project will generate a significant, net-positive renewable energy that will contribute to comply with Uruguay’s energy demand. Now, the Uruguayan energy matrix relies heavily on hydroelectricity (responsible for attending 73% of the national demand per year) and imported energy (responsible for the remaining 27%). As such, it is important for the country to diversify its energy sources.²⁵

Long term monitoring has been planned for the Plant’s 20 years operation period. The monitoring allows a more efficient operation of the facility: *“The maintainer will own and maintain a line of communication available via satellite between its maintenance headquarters and the wind farm, for remote access to each AEG.”*²⁶ Two different companies will be in charge of monitoring Wind Farm Peralta. The first one is Epatir S.A., which will be the subcontractor responsible for general maintenance. The second is Gamesa, the manufacturer of the turbines that will be responsible for the supervision and maintenance of the generators throughout its lifespan.

4.3.3. Water:

In the **Water subcategory**, out of three credits, one was evaluated as non-achieving (RA3.2 Reduce Potable Water Consumption) and two were assessed as “Improved” (RA3.1 Protect Fresh Water Availability and RA3.3 Monitor Water Systems).

²⁴ Report of request for national approval, Annex d; Contribution to Sustainable Development, Peralta Windfarm 03_01_2012, chapter 3.1.6, page 7.

²⁵ Report of request for national approval, windfarm Peralta 06_29_2012\ Annex b “Project Design Document (PDD), according to international format approved by the Executive Board. Clean Development Mechanism” section A.2 page 2

²⁶ Turbines Maintenance Contract between Palmatir (owner) and Epartir (maintainer). February 15, 2013, clause 3.1.2 “Local operation”

Currently (during construction phase), water is being extracted from an on-site well, mainly for concrete production. Efforts to reuse water have been put in practice, and, between December of 2012 and March of 2013, the percentage of reused water has fluctuated between 13% and 33%.²⁷ It is relevant to point out that as of the writing of this case, no water availability assessment has been done.

Water consumption is expected to decrease drastically after the end of the construction phase. There is no information available regarding measures to reduce water consumption in the operation phase; nevertheless, it is important to note that with only 6 to 8 employees as permanent staff, water consumption is expected to be quite low. In terms of monitoring the water systems, it has been stated that the hydrologic connections are not affected by the project. Furthermore, no impacts in terms of water contamination have been identified in the last months.

4.3.4. Non-applicable credits

There is one credit that is considered non-applicable, RA2.1 Reduce Energy Consumption. The amount of energy used in the operation of this project could be considered very low, with only one location of energy consumption: the office area. There are no specific initiatives to reduce energy consumption; however, as specified in the “PGA annex 2 in the Environmental Monitoring Plan”, two of the variables controlled monthly are water and electricity consumption. In the future, this data could lead to the implementation of measures to reduce the use of both.

4.3.5. Summary of results for the Resource Allocation category.

The table below (**figure 33**) shows the distribution of credits, as well as the level of performance achieved in each credit. The biggest opportunities for improvement are concentrated in the subcategories Water and Materials. Considering all credits and the maximum possible values for each indicator, the percentage of achievement adds to 43%, or 70 points out of 164.

22	RESOURCE ALLOCATION	MATERIALS	RA1.1 Reduce Net Embodied Energy	0	Non Achieving	18
23			RA1.2 Support Sustainable Procurement Practices	6	Superior	9
24			RA1.3 Used Recycled Materials	5	Enhanced	14
25			RA1.4 Use Regional Materials	3	Improved	10
26			RA1.5 Divert Waste From Landfills	8	Superior	11
27			RA1.6 Reduce Excavated Materials Taken Off Site	6	Conserving	6
28			RA1.7 Provide for Deconstruction & Recycling	8	Superior	12
29		ENERGY	RA2.1 Reduce Energy Consumption	0	Not-Applicable	0
30			RA2.2 Use Renewable Energy	20	Restorative	20
31			RA2.3 Commission & Monitor Energy Systems	11	Conserving	11
32		WATER	RA3.1 Protect Fresh Water Availability	2	Improved	21
33			RA3.2 Reduce Potable Water Consumption	0	Non Achieving	21
34			RA3.3 Monitor Water Systems	1	Improved	11
			RA0.0 Innovate Or Exceed Credit Requirements	0	Non Achieving	
		RA	70		164	

Figure 33: Summary of results in Resource Allocation category

²⁷ Environmental Monitoring Plan, PSA- 120275, Checkpoint 18. Environmental impact of resource depletion. Water consumption.

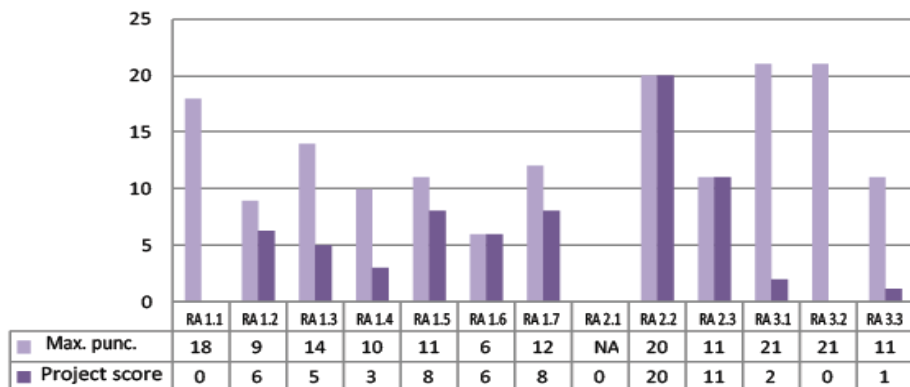


Figure 34: Summary of results in Resource Allocation category

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.”²⁸ 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).

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		L&W	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		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
			15	33	86	165	169	

Figure 35: Natural World credit distribution

4.4.1. Siting:

The **siting sub-category** presents a large dispersion of results, some credits such as (NW 1.2 Protect Wetlands and Surface Waters) have been assessed as “Improved”, other credits (NW 1.5 Preserve Floodplain Functions), are determined as “Enhanced”. Other than that, one credit was evaluated as “Superior” (NW1.1 Preserve Prime Habitat), one credit was assessed as “non-achieving” (NW1.7 Preserve Greenfields), and the rest of the credits in this category, (NW1.3 Preserve Prime Farmland, NW

²⁸ Envision Guidance Manual, p.116

1.4 Avoid Adverse Geology and NW1.6 Avoid Unsuitable Developments on Steep Slopes) have been determined as “Conserving”.

Wind Farm Peralta is located in a natural area that National Cartographic Plan does not consider a location of high ecological value.²⁹ Thus, the project’s impact is expected to be low. The project site and the surroundings are dedicated to extensive, mixed livestock production on unimproved natural pastures. Animal husbandry is in general, compatible – in economic terms – with the operation of the Wind farm. The project area is not farmland.³⁰ In terms of adverse geology, a Geology Assessment was developed in September 2011 and no adverse geologic or natural hazards have been identified.

The project is not located in what it is considered floodplain. Construction of the project does not increase flood elevations or water storage. Infiltration and water quality are maintained. Considering the credit NW1.6, the concession area is not located on a hillside or a steep slope site. Therefore, there are no specific risks pertaining to erosion and landslides associated with the site. As specified in the documentation, *“Due to the limited earth moving works and the reduced footprint of the project, the soil quality will not be modified in any way.”*³¹

There are no wetlands or significant surface waters within the project site. To prevent impacts derived from the construction, the distance from the water bodies to the turbines must be 25 meters at least, including foundations.³² Because of this buffer zone, the area of soil and vegetation effectively protected has increased. There are small streams in the concession site and the distribution line (LAT) area.

The project is being built on an existing greenfield. However the impact is expected to be low due to two considerations: the land footprint of the project is quite small when compared with the extension of the property where is built—38 hectares, which represent approximately 3% of the total surface—and, more importantly, Uruguayan planning agencies have assessed the area as site of Low Ecological Relevance.³³

²⁹ “The National Cartographic Plan (1:50.000), which belongs to the study area, have an ecological relevance index very low (0 to 0.18) (Figure 3-2). According to this index, 40.1% [...] from Uruguay were classified as low or very low relevance” (Preliminary Environmental Assessment LAT page 9)

³⁰ **Definition of Prime Farmland:** Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses. It has the combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods. In general, prime farmland has an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, an acceptable level of acidity or alkalinity, an acceptable content of salt or sodium, and few or no rocks. Its soils are permeable to water and air. Prime farmland is not excessively eroded or saturated with water for long periods of time, and it either does not flood frequently during the growing season or is protected from flooding. - From Envision’s Glossary Page 173.

³¹ Report of request for national approval, windfarm Peralta 06_29_2012, Annex d) Contribution to Sustainable Development, Peralta Windfarm 03_01_2012, page 6.

³² Environmental Management Plan (PGA), Windfarm Peralta and line (PGA), UTE Inabensa Teyma Peralta 08_12, chapter 6.2, page 8.

³³ The study alluded to is the analysis of “Geographical priorities for the conservation of land bio-diversity in Uruguay”, as quoted in the Preliminary Environmental Assessment for the High Tension Line, page 9.

4.4.2. Land and water:

In the **land and water** subcategory, out of three credits, one was assessed as “Conserving” (NW2.1 Manage Stormwater), one was evaluated as “Enhanced” (NW2.3 Prevent Surface and Groundwater Contamination), and one was considered to be non-applicable (NW2.2 Reduce Pesticide and Fertilizers Impact).

Soil absorption capacity is equal to that of the land pre-development. Impervious areas have practically not changed, and the only affected spaces are the tower’s foundations and the footprint of the office building. In the concession area, the water naturally flows to existing streams. Roads and pathways are built with gravel or soil to allow rainwater infiltration. After the construction of the paths is finished, sedimentation runoff needs to be monitored periodically,³⁴ according to what is stated in the Environmental Management Plan (PGA).

Different measures were planned in order to avoid soil contamination during construction and operation phases. One of the possible sources of contamination previously identified for the construction phase is the concrete fabrication process. The project team put in place special areas for cleaning up the concrete mixers and a system for the treatment of effluents. Another possible source of soil or groundwater contamination are oil spills related with the maintenance of the turbines. Maintenance is expected to take place every six months, and the probability of contamination from this activity is considered quite low.³⁵ Also, the Environmental Management Plan aims to ensure the proper disposal of liquid and solid waste during construction phase.

4.4.3. 4.3.3 Biodiversity:

In the **biodiversity subcategory**, Wind Farm Peralta presents a good performance. Considering all four credits, two were evaluated as “Conserving” (NW3.3 Restore Disturbed Soils and NW3.4 Maintain Wetland and Surface Water Functions), one was assessed as “Improved” (NW3.1 Preserve Species Biodiversity), while one credit was considered to be non-applicable (NW3.2 Control Invasive Species).

Several studies were made in order to evaluate the impact of Wind Farm Peralta on local biodiversity. Prior to the start of construction, the flora and fauna had been studied.³⁶ The main fauna impacts are expected to be for birds and bats, due mainly to collisions with the turbines and the cables of the LAT. Some other impacts are disturbances and displacement, barrier effect, and habitat destruction.³⁷ The site selected for Palmatir’s project is 80 km away from the nearest area of importance for birds, and this will very likely reduce overall impact. Mortality of birds due to collision and electrocution, and disorders to animal health related with the LAT are considered medium-level impacts.

³⁴ Environmental management plan,(PGA) Windfarm Peralta and line 150 kV Annex 3 - Matrix of significant aspects.

³⁵ ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011 page 56.

³⁶ LAT, Annex III, Chapter 5, Composition and Impact Report on Environment and Birds report. ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011, Chapter 3.2.2 “birds” page 18\ Chapter 3.2.3 “bats” page 19\ Chapter 3.2.4 “flora” page 20\ Annex I: Report on the impact of Palmatir Wind Farm on wildlife by Enrique M. Gonzalez & Ismael Etchevers.

³⁷ Report of request for national approval, windfarm Peralta 06_29_2012, Annex d) Contribution to Sustainable Development, Peralta Windfarm 03_01_2012 , Chapter 3.1.5, page 7.\ ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011, Chapter 4.8: Impairment to flying birds and mammals pages 51 to 54.

Regarding excavations, several measures were taken in order to ensure that 100% soil restoration is achieved. Excavated material will be re-used after being properly compacted and will fill the top of the foundations. Proper compaction is highly necessary to avoid erosion. Beyond the process of physical restoration, legal and financial measures are required to guarantee that the soil will not be negatively affected by the project. A mandatory assurance was required to the project developers demanding the *“reconstruction of the environment to its previous state after the project lifespan is achieved, or even if the project has been abandoned.”*³⁸

Regarding wetland and surface water functions, the project will not affect negatively any of the four variables considered: maintenance or enhancement of hydrological connection, water quality, habitat [of species], and finally maintenance or restoration of sediment transportation.



Figure 36: Overview of the field where the windfarm is going to be located \ Source: Picture taken during the onsite visit May 2013



**Figure 37: Use of the land around the windfarm.
Source: Picture taken during the onsite visit May 2013**



**Figure 38: Use of the land around the windfarm.
Source: Picture taken during the onsite visit May 2013**

³⁸ Request for National Approval, Annex e), page 4, clause d).

Palmatir wind power project, Uruguay



Figure 39: Birds in the area. *Larus cirrocephalus*; *Athene cunicularia*; *Sturnella Superciliaris* (down) / Source: EIA original pg 18, Figure 3-4

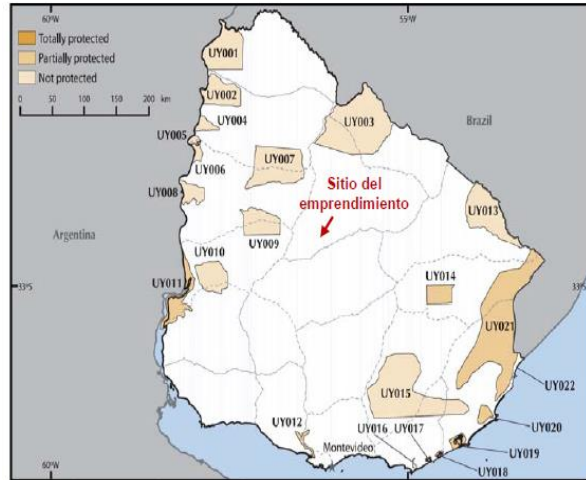


Figure 40: location of the areas of impotence for birds (IBAs) (Aldabe et ál. 2009) / Source: EIA original pg 19, Figure 3-5



Figure 41: Example of some species in the area
Source: Picture taken during the onsite visit May 2013



Figure 42: Example of farming in the area
Source: Picture taken during the onsite visit May 2013



Figure 43: Existing streams in the area
Source: Picture taken during the onsite visit May 2013



Figure 44: existing streams in the area
Source: Picture taken during the onsite visit May 2013



Figure 45: Material storage at the edge of the foundation
Source: Picture taken during the onsite visit May 2013



Figure 46: Reuse of the excavated material to fill the top of the foundation
Source: Picture taken during the onsite visit May 2013

4.4.4. Non-applicable credits:

There are two credits in this category that have been considered non-applicable: NW2.2 Reduce Pesticides and Fertilizer Impacts and NW 3.2 Control Invasive Species. Referring to the reduction of pesticides, there is no mention in the documentation about measures to avoid or minimize its use. Considering that the current land use relates to livestock, the use of pesticides is not necessary. Regarding to the control of invasive species, no plants (either local or exotic) will be introduced in the site for reforestation purposes.

4.4.5. 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.

35	SITING	NW1.1 Preserve Prime Habitat	9	Superior	18	
36		NW1.2 Preserve Wetlands and Surface Water	1	Improved	18	
37		NW1.3 Preserve Prime Farmland	6	Conserving	15	
38		NW1.4 Avoid Adverse Geology	5	Conserving	5	
39		NW1.5 Preserve Floodplain Functions	5	Enhanced	14	
40		NW1.6 Avoid Unsuitable Development on Steep Slopes	6	Conserving	6	
41		NW1.7 Preserve Greenfields	0	Non Achieving	23	
42	L & W	NW2.1 Manage Stormwater	17	Conserving	21	NA
43		NW2.2 Reduce Pesticides and Fertilizer Impacts	0	Non-applicable	0	
44		NW2.3 Prevent Surface and Groundwater Contamination	4	Enhanced	18	
45	BIODIVERSITY	NW3.1 Preserve Species Biodiversity	2	Improved	16	NA
46		NW3.2 Control Invasive Species	0	Non-applicable	0	
47		NW3.3 Restore Disturbed Soils	8	Conserving	10	
48		NW3.4 Maintain Wetland and Surface Water	15	Conserving	19	
		NW0.0 Innovate or Exceed Credit Requirements	0	Non Achieving		8
		NW	78		183	

Figure 47: Summary of results in Natural World category

The performance in Natural World (NW) can be improved, considering *Envision’s* 5 sets of analysis. Opportunities for improvement can be found in all three sub-categories (Siting, Land and Water, Biodiversity). Considering all credits and the maximum possible values for each indicator, the percentage of achievement adds to 42.62%, or 78 points out of 183.

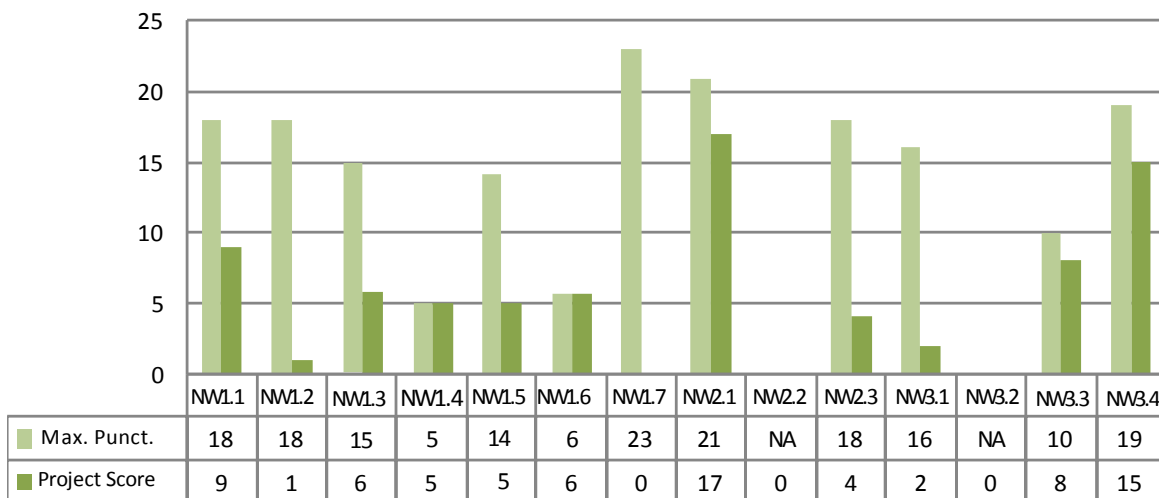


Figure 48: Summary of results in Natural World category

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.*”³⁹ 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).

49	Emission	CR1.1 Reduce greenhouse gas emissions	4	7	13	18	25
50		CR1.2 Reduce air pollutant emissions	2	6		12	15
51	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	3		10	17	21
55		CR2.5 Manage heat islands effects	1	2	4	6	
			12	21	39	100	101
			79	178	355	700	514

Figure 49: Climate and Risk credit distribution.

³⁹ *Envision* Guidance Manual, p.150

4.5.1. Emissions

Wind Farm Peralta achieves an outstanding performance in the **emissions sub-category**. Out of two credits, one was assessed as “Restorative” (CR1.1 Reduce Greenhouse Gas Emissions) and one as “Conserving” (CR1.2 Reduce Air Pollutant Emissions).

The project will lead to a reduction in carbon equivalent emissions and it is considered net carbon negative. Wind Farm Peralta will constitute a positive contribution to Uruguay’s sustainable development, not only for the aforementioned reduction in greenhouse gas emissions, but because it will contribute to a more diversified, and therefore resilient, energy matrix.

It has been estimated that over a period of seven years, the Aeolic energy plant will result in the avoidance of emission of 815,862 tons of CO₂. To establish with accuracy the reduction in GHG emissions, a monitoring process will be developed according to industry standards.⁴⁰ All data collected as part of the monitoring plan will be kept for two years after the last accreditation period. Sub-contractors engaged with tasks at Wind Farm Peralta must also report CO₂ emissions, in order to consolidate an overall amount.

The project will also reduce pollutants such as SO₂, NO_x and particulate matter, related with the use of fossil fuels for power generation. As it can be read in the Report / request for national approval “(...) *each Kwh of electricity generated by wind power instead of coal prevents the emission of 0.60 kg of Carbon dioxide, 1.33 gr of sulfur dioxide and 1.67 gr of Nitrogen Oxides.*”⁴¹

4.5.2. Resilience

The **resilience subcategory** offers several opportunities for improvement. Out of five credits, one was assessed as “Conserving” (CR2.2 Avoid Traps and Vulnerabilities), two were evaluated as non-achieving (CR2.1 Assess Climate Threat, and CR2.3 Prepare for Long Term Adaptability), while two were considered to be non-applicable (CR2.4 Prepare for Short Term Hazards, and CR2.5 Manage Heat Islands Effects).

A serious vulnerability in Uruguay is the dependence on a non-diversified energy matrix. As has been previously explained, the country relies almost entirely on hydroelectric and thermoelectric power plants, the later ones fueled with imported oil. Wind Farm Peralta will contribute not only to the production clean energy but also to the achievement of a more diversified, resilient energy matrix.

No impact assessments or adaptation plans related with climatic threats have been developed. No long-term adaptability plans have been developed either.

⁴⁰ All measures will be taken through proper monitoring equipment calibrated in accordance with industry standards (URSEA Decision No. 14002 of November 27, 2002).\ <http://www.ursea.gub.uy/inicio>

⁴¹ Report of request for national approval – Wind Farm Peralta 06_29_2012, Annex d, Chapter 3.1.2 page 5.

4.5.3. Innovative or exceed credit requirements

The implementation of an inventory of greenhouse gases (GHG), was evaluated as worthy of the recognition of an innovative credit. The aforementioned inventory allows the measuring of GHG emissions related to any company or type of activity. As a consequence, this procedure promotes awareness within the administrators of the Wind Farm and sub contracted parties, who must implement their own inventories. This system is based on an internal policy of Abengoa, and is required in all projects undertaken by the parent company and its subsidiaries. *“The purpose of the inventory is to gain in-depth knowledge of the direct and indirect GHG emissions of each one of our activities, thereby enabling us to: draw up annual reduction plans, label our products and services, and evaluate suppliers according to the GHG emissions associated with the products and services they provide.”*⁴² This innovative credit will improve the efficiency or sustainability of a project.

4.5.4. Non applicable credits

In this category, there are two credits that have been considered non applicable, CR2.4 Prepare For Short-Term Hazards and CR2.5 Manage Heat Island Effects. The hazards assessment applicable to this credit must extend for at least the next 25 years, according to *Envision’s* matrix. Considering the lifespan of this project is 20 years, the variable does not apply to the case of Wind Farm Peralta. In terms of heat island effect, nothing has been constructed that would result in a heat island, making the credit also not applicable to Wind Farm Peralta.

4.5.5. Summary of results: Climate and Risk category.

The table below (**figure 50**) shows the distribution of credits as well as the level of performance achieved in each credit:

49	EMISSION	CR1.1 Reduce Greenhouse Gas Emissions	25	Restorative	25	
50		CR1.2 Reduce Air Pollutant Emissions	12	Conserving	15	
51	RESILIENCE	CR2.1 Assess Climate Threat	0	Non Achieving	15	
52		CR2.2 Avoid Traps And Vulnerabilities	16	Conserving	20	
53		CR2.3 Prepare For Long-Term Adaptability	0	Non Achieving	20	
54		CR2.4 Prepare For Short Term Hazards	0	Non-applicable	0	NA
55		CR2.5 Manage Heat Island Effects	0	Non-applicable	0	NA
		CR0.0 Innovate Or Exceed Credit Requirements	5	Innovative credit		5
		CR	58		95	

Figure 50: Summary of results in Climate and Risk category

Climate and Risk (CR) presents a very good performance, being the best among the five categories for this project. Opportunities for improvement can be found in the resilience subcategory. Considering all credits and the maximum points available for each credit, the percentage of achievement adds to 61.05%, or 58 points out of 95. In this category, the innovation credit (5 points) has been awarded.

⁴² GHG inventory: http://www.abengoa.es/web/en/gestion_responsable/principales_iniciativas/inventario_gases/

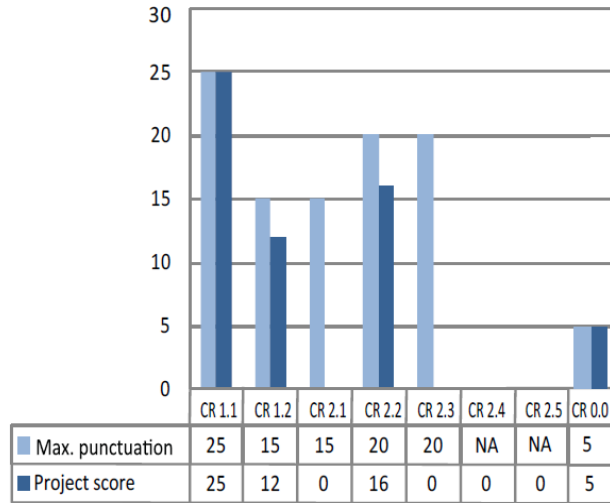


Figure 51: Summary of results in Climate and Risk category
 (*) CR.00, represents the innovation credits

5. RESULTS AND CONCLUSION

The evaluation of Wind Farm Peralta has shown the strengths of this project and its significant contribution to Uruguay's sustainable development. Furthermore, this evaluation has pointed out which categories of analysis provide great opportunities for improvement.

In the Quality of Life category, the project obtained 80 out of 155 points, or 52%. This is the second best performance of Wind Farm Peralta in the five categories of *Envision's* rating system. The project is expected to improve quality of life through the generation of clean energy. Also, the Aeolic generation plant at Tacuarembó Department will bring positive impacts in terms of technology transfer and creation of jobs, especially during the construction phase. The project will provide training to employees both in construction and in operation phases. Community needs and concerns have been addressed through a number of public hearings.

Through the Preliminary Environmental Assessment of the High Tension Line (LAT), a place of cultural and historical relevance was identified: "Cerro de las Ánimas", located some 5 kilometers northeast from the LAT. A protocol was established stating the procedures to follow in the event of historical or archeological findings at the project site.

Impacts on the health and quality of life of the people close to the project were carefully evaluated. There are six houses within one km of the project concession area, and one of those houses is within the windfarm. The studies included the evaluation of impacts by noise, electromagnetic fields, and shadows. All of those variables were considered to be below maximum allowable values. An adjustment in the position of some of the generators was made in order to fulfill the Dinama requirements.⁴³ The impact on the scenic qualities of the site was assessed as high due to the proximity of Wind Farm Peralta to National Route 5. Mitigation measures were established.

In Leadership, the project obtained 53 out of 113 points, or 47%, being the third best performance of Wind Farm Peralta in the five categories of *Envision's* rating system. The project is an example of leadership in sustainability, fulfilling all the requirements of the Kyoto Protocol. All the contractors involved in the construction process have responsibilities toward sustainability, clearly stated in the Environmental Management Plan (PGA).

Different aspects such as solid waste treatment, noise control and ground alteration are monitored in order to evaluate the level of performance in the construction phase. An active effort to promote collaboration is also stated in the PGA. Personnel are expected to work together in order to achieve sustainability goals. Furthermore, prior to the beginning of the construction phase, detailed information was provided to the community through a process of public hearings. The project will improve infrastructural integration, by expanding and repairing the existing local network of roads.

With regard to long term monitoring, a maintenance plan has been developed both for the construction and operation phases. The expected lifespan of the project is 20 years but that period could be

⁴³ National Environmental Agency (Uruguay)

extended with proper maintenance. Finally, pursuing by-product synergy opportunities, or industrial ecologies, is a clear opportunity to improve the sustainability performance of Wind Farm Peralta.

In the Resource Allocation category, the project obtained 70 of 164 points, or 43%. This performance ranked fourth among the five categories for Wind Farm Peralta in *Envision's* rating system.

The support of sustainable procurement practices is a strong point of the project: a consistent evaluation of all suppliers was carried out. To work as sub-contractor or supplier at Wind Farm Peralta, adherence to the code of social responsibility was compulsory. Furthermore, all suppliers are required to sign the "Agreement for the implementation of a System of GHG emission reporting".

Several efforts to use recycled materials or re-use materials *in situ* are being developed. Earth from excavation is being reused for filling the upper part of the foundations or to repair roads, thus reducing the amount of excavated materials taken off site. Recycled steel bars are being used in the concrete. Several other materials, such as wood, construction debris, plastic bottles, paper, cardboard, batteries, and oil, are being properly collected and disposed of during construction phase. Whenever possible, local materials were used; however, in this case that was limited to raw materials (earth, gravel) and commodities (such as steel and cement).

The use of renewable energy and the monitoring of energy systems are other aspects where Wind Farm Peralta excels. With 25 turbines and 50 MW of total installed capacity, the project generates a significant amount of renewable energy. Furthermore, the wind project is a relevant contribution to the diversification of Uruguay's energy matrix, which relies heavily in hydroelectricity and thermoelectric power plants that run on imported oil. Long term monitoring has been planned for the expected 20 years of operation of Wind Farm Peralta. This will allow for more efficient operation and energy production at the facility. The monitoring process will be undertaken by two companies: Epatir and Gamesa. The former will be the general sub-contractor responsible for maintenance, while the latter will provide supervision and maintenance to the generators throughout its lifespan.

During construction phase, water is being extracted from an onsite well. Efforts to employ reused water for concrete production are in place. Between December 2012 and March 2013 reused water represented from 13% to 33% of the total of water used. Several studies stated that the hydrologic connections are not affected by the project.

The two main opportunities for improvement pertain to the reduction of net embodied energy and potable water consumption. In both cases, no information is available regarding measures addressed to improve performance. It is important, however, to point out that potable water consumption is expected to be very low during operation phase due to the fact that only 6 to 8 people will work at the Aeolic energy plant during that stage.

In the Natural World category, the project obtained 78 out of 183 points, or 42.62%, being the least efficient performance of Wind Farm Peralta in the five categories of *Envision's* rating system.

Wind Farm Peralta is located in an area assessed as not being of high ecological value. The impact that the project represents for the environment is, on the whole, expected to be low. The wind farm location is currently used for livestock production, an activity that is compatible with the generation of Aeolic energy. There are no significant wetlands or surface water bodies within the concession, with the exception of some streams and natural drainage channels. To prevent possible impacts related to the

construction process, the distance of the turbines, including the foundations, to any water body, must be at least 25 meters. As a result of these buffer zones, the protection of vegetation and water bodies is expected to be improved.

The water absorption capacity is expected to remain practically unchanged after the project is built. The only affected areas are the tower's foundations and the footprint of the office building. Sedimentation and runoff must be monitored periodically. In order to avoid soil and groundwater contamination, several measures are being implemented. Two possible sources of contamination are concrete spills, during construction phase, and oil contamination related with the maintenance of the turbines, during operation phase. There is no adverse geology in the area according the Geology Assessment developed in September 2011. The construction does not increase flood elevations or water storage. Water quality is not expected to be affected in any way either.

Several studies were conducted in order to evaluate the impact of the project on the local biodiversity. The different species of flora and fauna have been accounted. Impacts on wildlife, especially birds and bats, were assessed as "medium". The main expected impacts are collisions, disturbances, displacements, barrier effects and habitat destruction. The High Tension Line is also expected to have a medium impact on the health of animals, and it is likely to cause mortality of birds due to electrocution and collision with cables.

Complete soil restoration is expected after the construction phase, that includes reusing and compacting land from excavations to cover the tower's foundations. A "before and after" photographic record will be done in order to guarantee that full restoration is achieved. Beyond physical restoration, the project owner is obliged to provide assurance for the reconstruction of the environment to a pre-project stage after the lifespan of Wind Farm Peralta is over, or even if the project is abandoned.

In the category Climate and Risk, the project obtained 53 out of 95 points, and 5 more points as innovation credits. This represents 61%, being the best performance of Wind Farm Peralta out of the five categories of *Envision's* rating system.

Excellent evaluations were achieved in the GHG emissions and air pollutants credits. As previously mentioned, an innovative credit in this category has been achieved: an inventory of greenhouse gas (GHG), has been implemented to measure the emissions, associated with sources that are under Abengoa's control.

Wind Farm Peralta is expected to result in a reduction of 815,862 tons of CO₂, and other pollutants such as SO₂, NO_x and particulate matter in a period of seven years. Furthermore, projects such as Wind Farm Peralta contribute to the diversification of Uruguay's energy matrix. Thus, the Aeolic power plant reduces the vulnerability of the country *vis à vis* the dependence on imported oil, now used to produce 27% of all the electricity produced per year.

Assessment of climatic threats and long-term adaptability projects related with climate change are opportunities for improvement in this category.

The graph on the next page shows the performance of the project and total points achieved per category and in summary, benchmarked against the different award levels. Wind Farm Peralta in Uruguay, with 312 points, qualifies for a **Golden Award**.

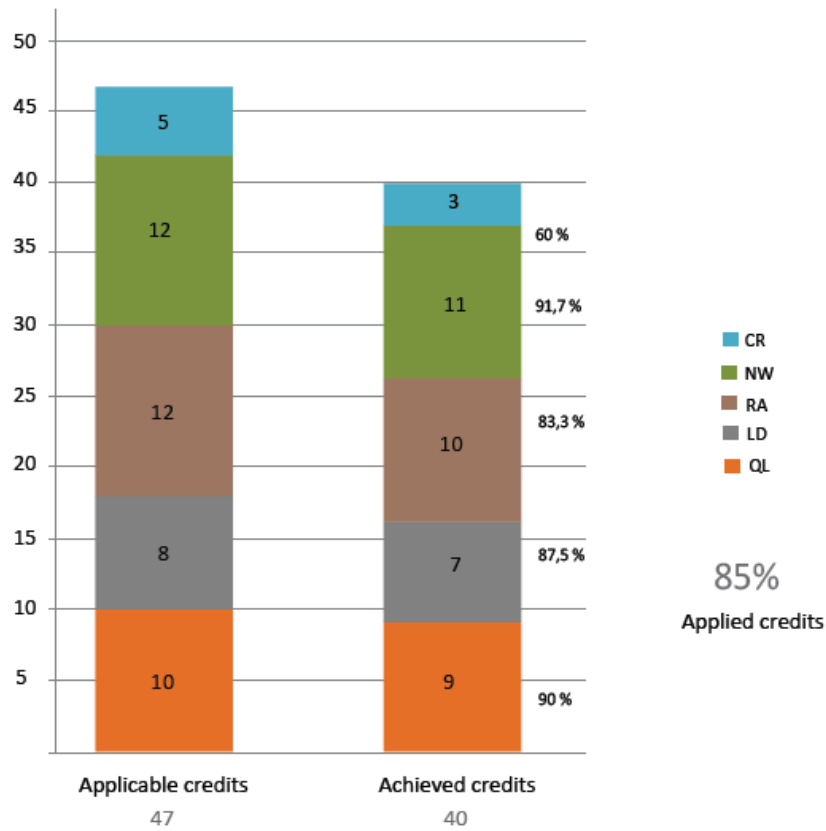


Figure 52: Awards distribution-

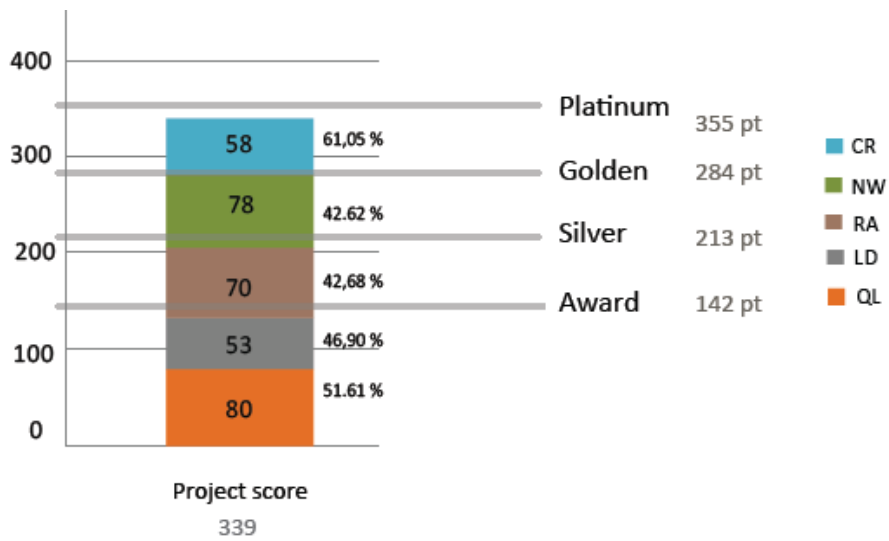


Figure 53: Awards distribution by credits achieved

6. APPENDIX A: PICTURES



Figure 1': School of Peralta. 12 km from the Find Farm



Figure 2': Overview of Peralta village



Figure 3': Overview of Peralta village



Figure 4': Surroundings of the Wind Farm



Figure 5': Paths of communication within the Wind Farm



Figure 6': Excavated soil to improve the paths



Figure 7': Foundation's excavation and stockpiling of soil for later reuse



Figure 8': Filling and compacting of the excavated area



Figure 9': wind turbine assembly



Figure 10': Wind turbine assembly



Figure 11': Transportation of the employees within the Wind Farm



Figure 12': Transportation of the employees within the Wind Farm



Figure 13': Stockpiling area to produce concrete



Figure 14': On site concrete plant



Figure 15': On site concrete plant



Figure 16': On site concrete plant



Figure 17': Construction materials recycling.



Figure 18': Steel for recycling.

Palmatir wind power project, Uruguay



Figure 19': View of a house inside the Wind Farm



Figure 20': View of a house inside the Wind Farm



Figure 21': Water steams inside the area



Figure 22': Water steams inside the area



Figure 23': Livestock breeding near the site.



Figure 24': Livestock breeding near the site.



Figure 25': Signs showing each of the turbines



Figure 26': Signs showing each of the turbines



Figure 27': Transportation of the turbines



Figure 28': Stockpiling of the towers.



Figure 29': View of one of the foundations



Figure 30': View of one of the foundations



Figure 31': Bulletin board on the construction site



Figure 32': Water well used for concrete fabrication.



Figure 33': Bottled water for human consumption



Figure 34': Changing rooms.



Figure 35': Fuel tank within the project area



Figure 36': Future operation building

7. APPENDIX B: ACRONYMS

	SPANISH	ENGLISH
DINAMA	Dirección Nacional de Medio Ambiente (Uruguay)	National Environmental Agency (Uruguay)
MVOTMA	Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente	Ministry of Housing, Territorial Planning and Environment
SEGEI	Emissions Reporting Greenhouse Gases	Reporte de Emisiones de Gases de Efecto Invernadero,
LAT	Línea de alta tensión	High voltage line
IBA	Áreas Importantes para las Aves	Important Bird Areas
CERs	Reducciones certificadas de las emisiones	Certified Emissions Reductions
CDM	Mecanismo de Desarrollo Limpio.	Clean Development Mechanism

8. APPENDIX C: ENVISION POINTS TABLE

			Improved	Enhanced	Superior	Conserving	Restorative		
1 2 3 4 5 6 7 8 9 10 11 12	QUALITY OF LIFE	PURPOSE	QL1.1 Improve community quality of life	2	5	10	20	25	
			QL1.2 Stimulate sustainable growth and development	1	2	5	13	16	
			QL1.3 Develop local skills and capabilities	1	2	5	12	15	
	WELLBEING	WELLBEING	QL2.1 Enhance public health and safety	2			16		
			QL2.2 Minimize noise and vibration	1			8	11	
			QL2.3 Minimize light pollution	1	2	4	8	11	
			QL2.4 Improve community mobility and access	1	4	7	14		
			QL2.5 Encourage alternative modes of transportation	1	3	6	12	15	
			QL2.6 Improve site accessibility, safety and wayfinding		3	6	12	15	
	COMMUNITY	COMMUNITY	QL3.1 Preserve historic and cultural resources	1		7	13	16	
			QL3.2 Preserve views and local character	1	3	6	11	14	
			QL3.3 Enhance public space	1	3	6	11	13	
			13	27	62	150	151		
13 14 15 16 17 18 19 20 21	LEADERSHIP	COLLABORATION	LD1.1 Provide effective leadership and commitment	2	4	9	17		
			LD1.2 Establish a sustainability management system	1	4	7	14		
			LD1.3 Foster collaboration and teamwork	1	4	8	15		
			LD1.4 Provide for stakeholder involvement	1	5	9	14		
	MNGMT.	MNGMT.	LD2.1 Pursue by-product synergy opportunities	1	3	6	12	15	
			LD2.2 Improve infrastructure integration	1	3	7	13	16	
	PLANNING	PLANNING	LD3.1 Plan for long-term monitoring and maintenance	1	3		10		
			LD3.2 Address conflicting regulations and policies	1	2	4	8		
			LD3.3 Extend useful life	1	3	6	12		
						10	31	56	115
22 23 24 25 26 27 28 29 30 31 32 33 34	RESOURCE ALLOCATION	MATERIALS	RA1.1 Reduce net embodied energy	2	6	12	18		
			RA1.2 Support sustainable procurement practices	2	3	6	9		
			RA1.3 Use recycled materials	2	5	11	14		
			RA1.4 Use regional materials	3	6	9	10		
			RA1.5 Divert waste from landfills	3	6	8	11		
			RA1.6 Reduce excavated materials taken off site	2	4	5	6		
			RA1.7 Provide for deconstruction and recycling	1	4	8	12		
	ENERGY	ENERGY	RA2.1 Reduce energy consumption	3	7	12	18		
			RA2.2 Use renewable energy	4	6	13	16	20	
			RA2.3 Commission and monitor energy systems		3		11		
	WATER	WATER	RA3.1 Protect fresh water availability	2	4	9	17	21	
			RA3.2 Reduce potable water consumption	4	9	13	17	21	
			RA3.3 Monitor water systems	1	3	6	11		
			29	66	112	170	62		
35 36 37 38 39 40 41 42 43 44 45 46 47 48	NATURAL WORLD	SITING	NW1.1 Preserve prime habitat			9	14	18	
			NW1.2 Protect wetlands and surface water	1	4	9	14	18	
			NW1.3 Preserve prime farmland			6	12	15	
			NW1.4 Avoid adverse geology	1	2	3	5		
			NW1.5 Preserve floodplain functions	2	5	8	14		
			NW1.6 Avoid unsuitable development on steep slopes	1		4	6		
		L&W	L&W	NW1.7 Preserve greenfields	3	6	10	15	23
				NW2.1 Manage stormwater		4	9	17	21
				NW2.2 Reduce pesticide and fertilizer impacts	1	2	5	9	
		BIODIVERSITY	BIODIVERSITY	NW2.3 Prevent surface and groundwater contamination	1	4	9	14	18
				NW3.1 Preserve species biodiversity	2			13	16
				NW3.2 Control invasive species			5	9	11
				NW3.3 Restore disturbed soils				8	10
NW3.4 Maintain wetland and surface water functions	3	6	9	15	19				
			15	33	86	165	169		
49 50 51 52 53 54 55	CLIMATE	Emission	CR1.1 Reduce greenhouse gas emissions	4	7	13	18	25	
			CR1.2 Reduce air pollutant emissions	2	6		12	15	
			CR2.1 Assess climate threat				15		
		Resilience	Resilience	CR2.2 Avoid traps and vulnerabilities	2	6	12	16	20
				CR2.3 Prepare for long-term adaptability				16	20
				CR2.4 Prepare for short-term hazards	3		10	17	21
				CR2.5 Manage heat islands effects	1	2	4	6	
			12	21	39	100	101		
Cumulative Total			79	178	355	700	514		

9. APPENDIX D: CREDIT DETAILS

CREDIT SPREADSHEET WITH DETAILS. PALMATIR CASE STUDY

QUALITY OF LIFE			
	PALMATIR WIND POWER PROJECT – URUGUAY		RECOMMENDATIONS
QI.1.1 Improve Community Quality of Life	20	<p>Conserving</p> <p>The community closest to Wind Farm Peralta is “Caserío Cuchilla de Peralta” 12 km away, population 264 inhabitants. In the immediate vicinity, defined by a buffer of approximately 1 km around the property, there are six houses, which increase to nine, considering the ones included in the corridor required for the high tension line. One of those houses is inside the boundaries of the project area.</p> <p>Previous to the implementation of the wind farm, several analyses have been developed in the context of the Environmental Impact Assessment (EIA). Those analyses have determined that both the magnetic fields and the noise generated by the turbines are within the maximum allowable values. Therefore, these two variables will not impact negatively on the quality of life of nearby communities.</p> <p>Two public hearings were developed to inform the public about the processes to follow for the execution of the Wind Farm. The response of the population on the hearings was positive, considering the social and environmental benefits that the project is expected to bring.</p> <p>The construction of the wind farm represents a great contribution to the area, and also to the country. The project "Wind Farm Peralta" promoted by the company Palmatir S.A contributes to the sustainable development of Uruguay meeting standards set out in the document "Sustainable development criteria for the approval of projects in the framework of the Clean Development Mechanism"</p>	<p>*Periodic update of the Management System Social Plan.</p> <p>*Minutes of meetings letters and memoranda with key stakeholders, community leaders and decision-makers for obtaining input and agreement regarding the impact assessment and planned actions.</p>
		<p><i>Sources: Report of request for national approval, windfarm Peralta 06_29_2012; Annex c; "Statement project's contribution to sustainable development" \ Annex d, "Declaration on the contribution to sustainable development in Uruguay" page 9 \ \ ATT355PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010, page 10, 11, 15 and 17 \ Annex IV, "Evaluation of electromagnetic field" \ ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011 page 21 and 55 \ \ National Approval Palmatir-LOA - Ministry of Housing, Territorial Planning and Environment, National July 30, 2012.</i></p>	

<p>QL1.2 Stimulate Sustainable Growth & Development</p>	<p>5</p>	<p>Superior</p> <p>Population density around the Wind Farm, in the rural area of the Department of Tacuarembó is 1.04 inhabitant/km², making of this location one of the less populated areas in Uruguay. Currently most inhabitants work on the farms or in animal husbandry.</p> <p>The community has a positive perception of the Wind Farm, because of the expected positive impacts on the economy and the environment. The wind park will have the capacity to supply electricity to approximately 50,000 houses. In the public hearings that took place, the citizens expressed interest in the impact of the project on local employment. Considering the low density and reduced population of the area, the construction of the project is expected to bring a great increase in the employment rate, especially in the construction period. <i>“We must differentiate between the stage of construction and operation. During the construction phase, around 100 people will work on the project, over a twelve to sixteen months period”</i>. Report of Request for National Approval, Chapter 3.2.3, page 8).</p> <p><i>Sources: Report of request for national approval, wind farm Peralta 06_29_2012 page 42, section E.2\ Annex D “Declaration on the contribution to sustainable development in Uruguay” pages 4, 8,10,12\ ATT3S5PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010 pages 10,11\ ZPC1108-,301_V3_ Public hearing of CDM Peralta I and Peralta II projects, 11_25_2011 page 4\ ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011 page 21,22 and 55.</i></p>	<p>* Evaluate how the project improves community attractiveness for compatible business and industries, and generally improves socio-economic conditions in the community.</p> <p>*Evaluate new employment opportunities that will be created, and the educational programs that will be conducted.</p>
<p>QL1.3 Develop Local Skills and Capabilities</p>	<p>12</p>	<p>Conserving</p> <p>Wind Farm Peralta has a great potential to develop new skills and capabilities. One of the goals of the project is to develop local “know-how” in wind power, which in turn, would contribute with the technological advancement of the country: <i>“It is important to highlight the technology transfer process that takes place as a result of the implementation of the project. This is a technology developed in Europe by a leading company in the design, manufacture, installation and maintenance of wind turbines”</i> (Report of Request for National Approval, Annex B, Section A.4.3, page 8).</p> <p>The project will provide training to employees both in construction and in operation phases. Furthermore, community needs have been considered through public hearings. An exhaustive research has been conducted to estimate the direct and indirect employment that will be generated in the area, as a consequence of the project: <i>“Staff hired for the project will come from Tacuarembó (area where the project will be developed). Such personnel will be trained for the tasks that a project like this requires. Thus, these people will have a high quality training after the development of his work, improving their competitiveness in accessing other jobs”</i> (Report of Request for National Approval, Annex D, Chapter 3.2.3, page 10).</p> <p>After the completion of the project execution, around 4-6 persons will keep working in the wind farm during the lifespan of the project. It is specified in the Turbines Maintenance Contract that at least 80% of those employed in the maintenance process, must be from Uruguay.</p>	<p>*Fulfill commitments for hiring local workers, including disadvantages groups, or disabled people.</p> <p>*Increase the ratio of required skilled employees in relation to overall project employment.</p> <p>*Evaluate proposed education and training programs.</p>

	<p><i>Sources: Report of request for national approval, windfarm Peralta 06_29_2012, annex B "Project Design Document", page 2, 8 and section E2 page 42, annex D "Declaration on the contribution to sustainable development in Uruguay" pages 8-11 \\ ZPC1108-301_V3_Public hearing of CDM Peralta I and Peralta II projects, 11_25_2011 page 4\\ ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011, chapter 4.9.3 page 55 \\ Environmental Management Plan, Windfarm Peralta and line, UTE Inabensa Teyma Peralta 08_12, point 11, page 11 \\ Turbines Maintenance Contract between Palmatir (owner) and Epatir (maintainer). February 15, 2013, clause 5 "subcontracting".</i></p>	
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">QL2.1 Enhance Public Health And Safety</p>	<p>16 Conserving</p> <p>Studies have been developed to identify the implications of magnetic fields in the surroundings of the wind field. As explained in the conclusion of the Preliminary environmental assessment of the distribution line, the results obtained are within the maximum allowable values.</p> <p>Due to possible negative effects on neighbors' health, studies have been conducted to analyze shadows projected by the turbines. Those analyses included both roads surrounding the wind farm and the houses in the vicinity. Data was updated after the modification of the EIA in October 2011, in order to reflect the relocation of certain turbines as a consequence of problems detected in the aforementioned shadows analysis.</p> <p>Due to the absence of local codes, international parameters were taken into consideration in the environmental study phase. Recommendations from the Danish Wind Industry Association and sentences from various Court decisions in Europe are among the used references. These international parameters were considered to frame the values obtained in the study developed at Wind Farm Peralta. (Modification of the Environmental impact assessment, Chapter 2.1; 2.2 pages 8-11)</p> <p>In the Environmental Management Plan (PGA), environmental risks were analyzed in order to identify possible impacts and determine the safest conditions for the different procedures. The protocols to follow in case of emergency are stated in forms 4/5.</p> <p><i>Sources: ATT355PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010, Annex IV, "Evaluation of electromagnetic field"\\ Environmental Management Plan (PGA), Windfarm Peralta and line, UTE Inabensa Teyma Peralta 08_12, chapter 1.1, page 3 \\ Form 4 - Plan of emergency - safety instructions, 01/June/12\\ Form 5 - emergency - phone Emergency Plan - Rev A0, 01/June/12</i></p>	<p>* Systematically document significant risks identified, changes instituted and appropriated sign-offs received.</p>

<p>QL2.2 Minimize Noise And Vibration</p>	<p>8</p>	<p>Conserving</p> <p>A detailed study has been conducted to assess noise impact. It has been stated in several documents that the levels of noise in the houses surrounding Wind Farm Peralta, are within the maximum allowable values: <i>“From the study of noise, it was determined that the maximum values in the vicinity of the houses did not exceed standards. (Brazilian Standard, CTESB L11.032)”</i> (Report of request for national approval, Annex b, table 15, page 41).</p> <p>The analysis shows the level of noise in dB at each of the houses is acceptable <i>“The EIA identifies 6 sensitive points regarding sound. Only one house is within the property and another 5 at a distance of less than 1 km. According to the Environmental Impact Assessment the established limit for rural areas (40dB) is not exceeded at any hour in any of the houses”</i> (Report of request for national approval, Annex d, chapter 3.2.5, page 13).</p> <p>Due to the change in position of some of the generators, as result of the requirements of DINAMA, a new EIA was developed. At the referred study the new conditions were analyzed and updated according to the proposed locations. In this new scenario, the noise in certain areas is slightly above the maximum allowable values, but those have been considered to be admissible impacts. A periodic control will be implemented to keep a monthly record of the noises generated. The highest levels of noise are expected to occur during the construction phase.</p> <p>Considering the big dimensions of the project site, disturbance to the population due to construction noise is expected to be low (Preliminary Environmental Assessment LAT, table page 16). Some measures such as periodic measurements of noise and compliance with the noise requirements in machinery have been proposed to mitigate noise in the construction phase.(PGA page 9, chap 7.1)</p> <p><i>Sources: Report of request for national approval, Wind Farm Peralta 06_29_2012, Annex b, “Project Design Document (PDD), according to international format approved by the Executive Board. Clean Development Mechanism”; Table 15 page 41\ Annex d, “Contribution to Sustainable Development, Peralta Windfarm 03_01_2012”chapter 3.2.5, page 13 \ \ ATT3S5PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010,page 16 \ \ Environmental Management Plan (PGA), Windfarm Peralta and line, UTE Inabensa Teyma Peralta 08_12, chapter 7.1 page 9\ Annex 1 - Environmental objectives of work Rev. A3. 120275, objective 3 \Annex 2– Environmental monitoring Plan work Rev.A3 120275, point 1\ Annex 3- Matrix of significant aspects\ \ ATT6AIOG Modification of the Environmental Impact Assessment for the installation of a wind farm in Peralta, Tacuarembó Department, October 11, 2011. Chapter 2.3, 2.4, pages 12-16.</i></p>	<p>*Develop proposals for ambient noise mitigation if required.</p> <p>*Analyze the documentation that estimates the levels of ambient noise and vibration and contrast those, to community needs or goals for livability.</p>
<p>QL2.3 Minimize Light Pollution</p>	<p>0</p>	<p>Non Applicable</p> <p>No light pollution will occur as a consequence of the construction of the turbines. Each tower will be illuminated according to safety regulations.</p>	

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">QL2.4 Improve Community Mobility And Access</p>	<p>14</p>	<p>Conserving</p> <p>At the Report of request for national approval, it is stated that the project owner will be responsible for maintenance of access roads. Maintenance works need to be carried out throughout the entire lifespan of the project. To improve the quality of the thoroughfares, several measures such as the control of the maximum weight and the reparation of roads in bad conditions will be deployed. (EIA chapter 3.3.3 page 22). As mentioned in other credits, there is integration between existing paths, and those used to access the turbines. By reusing existing infrastructure, the impact on the area is reduced and the existing infrastructure of transportation is improved.</p> <p>Furthermore, the paths used to access the turbines are shared with the ones used to access the houses located inside the farmland. For this reason, the assessment is that mobility and access to the community have been improved. Currently the access to Wind Farm also benefits from the proximity of National Route 5.</p> <p><i>Sources: Report of request for national approval, Wind Farm Peralta 06_29_2012, Annex e, "Prior environmental authorizations granted by the MVOTMA", point "j" \\ ATT355PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010, table page 16 \\ ATT4352I - Environmental Impact Assessment (EIA), Tacuarembó Department, July 2011, chapter 1.3 page 2, chapter 3.3.3 page 22 \\ Turbines Maintenance Contract between Palmatir (owner) and Epartir (maintainer). February 15, 2013, clause 3.3.2 "Maintenance of road infrastructure".</i></p>	<p>* Evaluate reports, memoranda, minutes of meetings with managers and operators in order to evaluate accessibility to nearby facilities and transport conditions.</p> <p>*Evaluate conditions of community mobility and access during the project's construction phase.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">QL2.5 Encourage Alternative Modes of Transportation</p>	<p>0</p>	<p>Non_Applicable</p> <p>The main modes of transportation to the site, are currently car or bus, through National Route 5. At this point, there is no information about the implementation of public transportation systems. During the operation phase the number of people required to run the wind farm is expected to be around 6-8. Due to the typology of the project increase walkability or empower non-motorized transportation such as bicycles, is considered to be non-applicable.</p> <p>During construction phase, several buses will transport personnel from their houses to the construction site and back. The assistance of buses is also available during lunchtimes</p> <p><i>Sources: ATT355PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010, chapter 3.3.3 page 11 \\ ATT4352I Environmental Impact Assessment (EIA), Tacuarembó Department, July 2011, chapter 3.3.3 page 22.</i></p>	
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">QL2.6 Improve Site Accessibility, Safety & Wayfinding</p>	<p>3</p>	<p>Enhanced</p> <p>New thoroughfares will be built, linking the different generators, in order to guarantee the accessibility to all areas. Some of the existing roads are going to be improved and re-used; and new ones will be built. (EIA chapter 4.5.1 page 41).</p> <p>Efforts to prevent soil erosion related with the road networks have been implemented. In the project site there are no sensitive areas with specific requests regarding accessibility.</p> <p>As previously explained, the traffic in the region is concentrated on National Route 5. Several measures to ensure proper signage from this Route to the project site have been taken. Furthermore, all generators at Wind Farm Peralta are clearly identified and labeled.</p>	<p>*Elaborate design documents and plants showing how the project will impact public safety and security.</p>

		<p>Sources: ATT3S5PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010, chapter 3.3.3 page 11\ ATT4352I Environmental Impact Assessment (EIA), Tacuarembó Department, July 2011 chapter 4.5.1 page 41 \ Environmental Management Plan (PGA), Windfarm Peralta and line, UTE Inabensa Teyma Peralta 08_12, Annex I, Objective N°4, actions.</p>	
QL3.1 Preserve Historic And Cultural Resources	1	<p>Improved</p> <p>A place of historical and cultural interest has been identified: “Cerro de las Animas”. At the preliminary report for the High Tension Line we can read the following: “Cerro de las Animas” [is located] approximately 5 miles northeast of the northern end of the LAT [Línea de Alta Tension or High Tension Line]. Its name dates back to the early nineteenth century because was used as a cemetery for settlers in the past. Currently still retain some of its tombstones and a pantheon of that period” (Preliminary Environmental Assessment LAT, chapter 3.4.1, page 12).</p> <p>Regarding Cerro de las Ánimas, the IM-275.001 form, containing the protocol to follow and the contact information in case of possible findings, has been created.</p> <p>Sources: ATT3S5PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010, chapter 3.4.1, page 12\ ATT6AIOG Modification of the Environmental Impact Assessment for the installation of a wind farm in Peralta, Tacuarembó Department, October 11, 2011.\ Annex 1 Study of archaeological heritage\ IM-275 001-Environmental-Action Instructions for incidental findings. Rev AO, July 13, 2012.</p>	<p>*Investigate which are the regulatory and financing institutions that could contribute to identify and preserve cultural and historical resources.</p>
QL3.2 Preserve Views And Local Character	1	<p>Improved</p> <p>The landscape in the region of the project site is mainly grassland. At the EIA we can read that: “From the landscape point of view, the site corresponds to the sub-region of Northwest prairies (Evia & Gudynas 2000). The landscape of this region is quite homogeneous, with few corridors and patches of significance, the most important of which are river corridors. The predominant relief in the area is mild hills (1-4%) sometimes flattened. The project is located on Cuchilla de Peralta and unfolds in the Southwest-Northeast direction” (EIA, chapter 3.1.2 page 13).</p> <p>Possible impacts on this landscape could be the alteration of the views due to the turbines and the projection of shadows. As specified on the Preliminary Environmental Assessment for the High Tension Line (LAT), page 17, the physical presence of the LAT has a “medium” degree of significance to the landscape environment. A detailed study about the “quality of the landscape” or the perception of the turbines, has been done, including a simulation of the real location of the generators (see EIA, Chapter 4.3, map views 1 and 2).</p> <p>The intention of this study was to determine the visual effect of the generators in the landscape. Regarding the results of this analysis, at the EIA we can read that: “Since the field is adjacent to Route 5, the possibilities and the frequency of perceiving the [transformed] landscape, will be high, therefore it is considered that the its susceptibility is high. Figures 3-7 and Figure 3-8 display the characteristics of the surroundings” (EIA, chapter 3.4.2, page 23).As a mitigation measure, the generators will be painted in a specific color (light grey), in order to blend them with the surroundings.</p>	<p>*Develop plans drawings and reports, identifying important elements of the site character.</p> <p>*Register any efforts to aid local communities in developing more comprehensive policies and regulations regarding views and fit with local character</p>

		<i>Sources: ATT4352I Environmental Impact Assessment (EIA), Tacuarembó Department, July 2011, chapter 3.1.2 page 13\chapter 3.4.2 page 23\ chapter 4.3.3 page 30 \ Report of request for national approval, Wind Farm Peralta 06_29_2012\ Annex b, "Project Design Document (PDD), according to international format approved by the Executive Board. Clean Development Mechanism"; Section D.1,Table 15, page 40\ Annex d, "Contribution to Sustainable Development, Peralta Windfarm 03_01_2012"chapter 3.2.5, page 12,13 \ ATT3S5PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010, chapter 3.4.1 page 12; table page 17.</i>	
QI.3 Enhance Public Space	0	Non Achieving No documentation describing new public spaces associated to the project such as parks, plazas o recreational facilities has been described.	* Analyze the impact of the project of existing public spaces, if so. *Elaborate plans, drawings showing the scope and extent of any restoration efforts to be made in public space.
QI.0 Innovate Or Exceed Requirements	0	N/A	
	80		

LEADERSHIP			
	PALMATIR WIND POWER PROJECT – URUGUAY		RECOMMENDATIONS
LD1.1 Provide Effective Leadership And Commitment	9	<p>Superior</p> <p>The type of project itself - a Wind Farm - speaks about a great commitment with sustainability. This project fulfills the requirements stated at the Kyoto protocol. The responsibilities towards sustainability of any of the contractors involved on the construction have been determined in the PGA. (Chapter 3.1 "Definition of responsibilities and contact details")</p> <p><i>Sources: Environmental Management Plan (PGA), Windfarm Peralta and line, UTE Inabensa Teyma Peralta 08_12, Chapter 3.1 pages 3,4,5 \ Form 3 - Emergency - Action Plan in case of emergency - Rev. A0 01_June/12.</i></p>	<p>* Disseminate the statements and principles of the owner's organization, and the leadership of the project team regarding their commitment to the principles of sustainability.</p> <p>* Disseminate ongoing significant actions taken to improve sustainable performance.</p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">LD1.2 Establish A Sustainability Management System</p>	<p style="text-align: center;">4</p>	<p>Enhanced</p> <p>The Environmental Management Plan states that during construction phase, the Site manager and foreman are responsible for environmental on-site control. (PGA chapter 3.1, page 5). Some of their tasks are to integrate environmental protection into the daily operations. There are different controls every month based on the environmental objectives (PGA Annex I). Here different aspects such as treatment of solid waste, noise control or impacts to the ground are monitored to determine the level of performance in the construction phase. No documentation has been created so far, for the next phases of operation and decommissioning.</p> <p><i>Sources: Environmental Management Plan (PGA), Windfarm Peralta and line, UTE Inabensa Teyma Peralta 08_12, chapter 3.1 page 5\ chapter 9.3 page 9\ chapter 10 page 11\ \ Form 3 - Emergency - Action Plan in case of emergency - Rev. A0 ;01_June_12.</i></p>	<p>*Strengthen the process of management in the long term, considering that the management during the construction phase is defined.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">LD1.3 Foster Collaboration and Teamwork</p>	<p style="text-align: center;">8</p>	<p>Superior</p> <p>The effort to promote collaboration it stated at the PGA. These efforts refer to the distribution of tasks during the execution of the project. Several members of the construction team, such as the Project manager, the technical assistant, the site manager and the foreman are expected to work together to achieve sustainable goals. The control and supervision of the construction process is made by a team on site.</p> <p><i>Sources: Report of request for national approval, windfarm Peralta 06_29_2012\ Annex b, "Project Design Document (PDD), according to international format approved by the Executive Board. Clean Development Mechanism" Section E page 35\ Annex d, "Contribution to Sustainable Development, Peralta Windfarm 03_01_2012" chapter 3.2.3 page 11\ Chapter 3.4 pages 20-22 \ \ Environmental Management Plan (PGA), Windfarm Peralta and line, UTE Inabensa Teyma Peralta 08_12, chapter 3.1 page 5\ chapter 9.3 page 9\ chapter 10 page 11\ \ Form 3 - Emergency - Action Plan in case of emergency - Rev. A0; 01_June_12.</i></p>	<p>*Strengthen a comprehensive planning process for the project.</p> <p>* Register the multi-disciplinary processes of management and control, through procedures, flowcharts, checklists and other similar measures.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">LD1.4 Provide For Stakeholder Involvement</p>	<p style="text-align: center;">14</p>	<p>Conserving</p> <p>Detailed information has been provided to the community in the process of public hearings. The promotion of the hearings was made by e-mail, invitations, posters and advertisements in several stores around the site and by radio. (Report of request for national approval, annex D chapter 3.4.1, page 21, hearing of CDM Peralta I and Peralta II projects).</p> <p>If activities at Wind Farm Peralta can affect the community, this must be notified to the neighbors: <i>"When performing activities that disturb the normal operation of traffic in the area, or generate noise in excess, a timely way to get notice to the affected community will be coordinated"</i> (PGA chapter 12, page 11)</p> <p><i>Sources: Report of request for national approval, Wind farm Peralta 06_29_2012\ Annex d) "Contribution to Sustainable Development, Peralta Wind farm 03_01_2012" chapter 3.4.1 page 21 \ \ Environmental Management Plan (PGA), Wind farm Peralta and line, UTE Inabensa Teyma Peralta 08_12, chapter 12, page 11 \ \ ZPC1108-301_V3_ Public hearing of CDM Peralta I and Peralta II projects; Palmatir S.A. and Cadonal S.A., Montevideo, November 25, 2011 pages 2,3,4.</i></p>	<p>*Compile letters, memoranda, notes, minutes, and lists of stakeholder groups.</p> <p>*Register opinions and concerns of stakeholders, and its impact on project decisions.</p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">LD2.1 Pursue By-Product Synergy Opportunities</p>	<p>0</p>	<p>Non_Achieving</p> <p>There is no data identifying any specific program for using unwanted materials from nearby facilities.</p>	<p>*Develop proposals to make use of the opportunities of by-product synergy.</p> <p>* Map and register opportunities in nearby facilities.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">LD2.2 Improve Infrastructure Integration</p>	<p>7</p>	<p>Superior</p> <p>In terms of energy distribution wind Farm Peralta is interconnected with the National system of power plants of Uruguay (Report of request for national approval, annex b, Table 11, page 27). As regards to access and transportation there are both existent and new roads and those are integrated in the property. Due to the reuse and improvement of existing roads, the amount of materials used in the construction of paths to access the turbines has been reduced. <i>“Some of the paths already exist, therefore some sections will be improved, and others will be built. A total of 17,200 m of internal roads will be constructed and 500 m of existing paths will be improved, giving access to areas where the wind turbines are located”</i> (EIA, chapter 4.5.1, page 41)</p> <p>The main Highway in the region is National Route 5, one of the road axes in the country.</p> <p><i>Sources: Report of request for national approval, wind farm Peralta 06_29_2012, Annex b; “Project Design Document (PDD), according to international format approved by the Executive Board. Clean Development Mechanism” Table 11, page 27 \\ ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011, chapter 4.5.1, page 41 \\ Environmental Management Plan (PGA), Windfarm Peralta and line, UTE Inabensa Teyma Peralta 08_12, chapter 6.1, page 6.</i></p>	<p>*Compile documentary evidence on how existing assets were incorporated and used.</p> <p>* Give documentary evidence on how existing infrastructure has been restored.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">LD3.1 Plan For Long-Term Monitoring & Maintenance</p>	<p>10</p>	<p>Conserving</p> <p>A maintenance plan has been developed for construction and operation phases. As stated in the Maintenance Contract, the maintenance of the wind farm will be carried out by Epartir S.A during the operation phase <i>“The maintainer will begin providing services on the effective date and will continue for twenty (20) years (the “Duration”) according to the terms of this agreement.”</i> (Turbines Maintenance Contract, clause 2, “Duration”).</p> <p>At the contract is clearly stated that resources and personnel assigned should be adequate to carry out properly the maintenance work. The need to create a contingency plan to cope with situations of environmental risk and emergencies has been contemplated. Such plans have been developed for construction and operation phases, and there are also guidelines for the decommissioning phase.</p>	<p>* Once the company responsible for maintenance has been designated, fund allocation must be guaranteed at sufficient levels to fund the necessary monitoring and maintenance.</p>

		<i>Sources: Report of request for national approval, windfarm Peralta 06_29_2012\ Annex d) "Contribution to Sustainable Development, Peralta Windfarm 03_01_2012" chapter 3.1.6 pages 7,8 \ \ ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011, chapter 5.2.2 page 59 \ \ Turbines maintenance contract between Palmatir (owner) and Epartir (maintainer). February 15, 2013, clause 2 "Duration".</i>	
LD3.2 Address Conflicting Regulations & Policies	0	Non_Applicable No conflict of regulations and policies, creating barriers to the implementation of this project of sustainable infrastructure have been detected. National and/or international regulations have been applied according to the standards.	
LD3.3 Extend Useful Life	1	Improved The lifespan of Wind Farm Peralta, according to the project documents is 20 years. Nevertheless the expansion of this lifespan is stated as a possible option: <i>"The useful life of the equipment to be installed is approximately 20 years, which can be extended with proper maintenance and repowering the wind turbines"</i> (EIA, chapter 5.3,page 60) <i>Sources: ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011, chapter 5.3 page 60.</i>	* Evaluate how the overall project design will allow for expansion reconfiguration, or multiple uses?
LD0.0 Innovate or Exceed Requirements	0	N/A	
	53		

RESOURCE ALLOCATION			
	PALMATIR WIND POWER PROJECT – URUGUAY		RECOMMENDATIONS
RA1.1 Reduce Net Embodied Energy	0	Non_Achieved No data is available to prove that a life cycle energy assessment was performed in accordance with recognized and accepted methodologies, data sources and software.	*An estimation of the Life-cycle energy assessment should be done. *Give information about embodied energy of the significant materials. *Strategies to reduce the embodied energy.

<p>RA1.2 Support Sustainable Procurement Practices</p>	<p>6</p>	<p>Superior</p> <p>It is considered that a strong evaluation of suppliers was carried out. To become a subcontractors or supplier at Wind Farm Peralta, the adherence to the Code of Social Responsibility it is compulsory. In this code, it is specified that all activities will be developed following environmental regulations which will change depending on the county where the project is located.</p> <p>Certain environmental requirements are stated on the contract between Palmatir and UTE Inabensa Teyma Peralta: <i>“The Contractor shall perform and fulfill a plan for executing the installation according to quality standards, as well as environmental, occupational, health and safety standards defined in UNIT-ISO 9001, ISO 14001 UNIT and UNIT OHSAS 18.001 respectively”.</i>(Clause 10, Article 5.6: Quality of the Installation).</p> <p><i>“The Contractor shall take all necessary measures to protect the environment as a result of its activities, both on and off site, avoid causing injury or damage to persons or property as a result of noise pollution, waste management and hazardous wastes - liquid solid or gaseous-, paints, removers or solvents or other inconveniences produced by procedures and methods used for the execution of the work, which may affect the environment”</i> (Artículo 6.11: Protección del medio ambiente), quoted in PGA Chapter 9.2, page 10.)</p> <p>Another measure applicable to all subcontractors who want to be involved in the execution of the project is the signing of the <i>“Agreement for the Implementation of a System of Greenhouse Gases Emission Reporting”</i>. <i>“The supplier undertakes [the obligation] to implement a System of Greenhouse Gases Emission Reporting, hereinafter SEGEI [...]”</i>.</p> <p>Several companies involved in the execution of the project are certified by 3rd party certifying organizations <i>“Both the EPC company (Engineering, Procurement and Construction) and the turbine supplier have certifications in quality management ISO 9001, environmental management systems ISO14001 and systems for the prevention of occupational hazards OHSAS 18001.”</i> (Report of request for national approval, Annex d, chapter 3.1.6, page 7)</p> <p><u>Sources:</u> <i>Environmental Management Plan (PGA), Windfarm Peralta and line, UTE Inabensa Teyma Peralta 08_12, Chapter 9.2, page 10\ Report of request for national approval, Annex d; Contribution to Sustainable Development, Peralta Windfarm 03_01_2012, chapter 3.1.6, page 7\ Environmental Management Plan (PGA), Windfarm Peralta and line, UTE Inabensa Teyma Peralta 08_12; Chapter 9.2, page 10. \ Agreement for the Implementation of a System of Emissions Reporting Greenhouse Gases.</i></p>	<p>*Register the total weight of volume of materials.</p>
<p>RA1.3 Used Recycled Materials</p>	<p>5</p>	<p>Enhanced</p> <p>The soil extracted in the excavations is being reused, mainly on the fixing of the paths and the filling of the foundations. The principal materials used in this project - other than the turbines themselves - are concrete and steel for the foundations of the generators. The steel used in the construction, belongs to a subcontractor that uses recycled bars.</p> <p>There is no information of recycled materials into the composition of the generators</p> <p><u>Sources:</u> <i>ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011, chapter 4.4.1 page 39.</i></p>	<p>* Quantify the total amount of materials and the percentage (by weight or volume) that are reused or recycled.</p>

<p>RA1.4 Use Regional Materials</p>	<p>3</p>	<p>Improved</p> <p>Certain material such as gravel - used in paths that connect different areas. – or sand have been locally sourced. The same criteria was followed with steel and cement. <i>“Roads are composed of a base of excavated material and / or properly compacted gravel covered by a layer of compacted ballast. These materials come from commercial quarries in the area, with environmental authorization for exploitation”</i> (EIA chapter 4.5.1, page 41).The wind turbines, were bought in the U.S, then, those are not regionally manufactured.</p> <p><i>Source: ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011, chapter 4.5.1, page 41 \ chapter 4.6.3 page 45.</i></p>	<p>* Evaluate the percentage of total project materials - by cost- that are sourced locally.</p>
<p>RA1.5 Divert Waste From Landfills</p>	<p>8</p>	<p>Superior</p> <p>Most of the materials extracted on-site, are reused within the boundaries of the project. Excavated soil (mostly related with the construction of foundations) has been used for filling-in some areas. The rest of the material will be spread out inside the project boundaries. The filling of the upper part of the foundations after the concrete is poured, will be done with material excavated from the same area.</p> <p>Other materials such as wires, copper or plastic will be transported to Paso de los Toros in order to be disposed of properly. Currently -during the construction phase- different materials such as, wood, construction debris, plastic bottles, paper, cardboard, batteries and oil are being recycled. One of the environmental objectives stated at the (PGA) is improvement of solid waste management on site.</p> <p><i>Source: ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011 Chapter 4.5.3 page 43 \ Chapter 4.6.1 page 44 \ Chapter 4.6.3 page 45 \ \ Environmental Management Plan (PGA), Windfarm Peralta and line, UTE Inabensa Teyma Peralta 08_12,Chapter 5, page 7 \ Annex 3 Environmental objectives of work Rev. A3. 120275 \ Annex 3 - Matrix of significant aspects.</i></p>	<p>* Evaluate the real amount of waste produced al the construction phase.</p> <p>*Monitor the efficiency or the strategies included in the project to reduce waste generation and to maximize waste reduce and recycling.</p> <p>*Develop specific strategies for hazardous products.</p>
<p>RA1.6 Reduce Excavated Materials Taken Off Site</p>	<p>6</p>	<p>Conserving</p> <p>As it has previously explained, earth coming from excavations is being re-used on the project site. Part of the volume of the excavation, is being used to fill the upper part of the foundations, while some of the material coming from excavations has been used for the construction of the interior paths. By doing this, the excavation material taken out of the site is reduced to zero, once that all excavation byproducts are used within the site. (EIA chapter 4.6.3, page 45).</p> <p>Another source of excavated material is the execution of the distribution line, taking into consideration that cables will be buried: <i>“The trenches will have a depth of 0.80 m and a sand bed to place the wiring. On top of that layer there will be another, of about 10 cm of sand, and a layer of compacted excavation material”</i> (EIA chapter 4.6.1, page 44).</p>	<p>* Keep implementing efforts oriented to keep null the volume of excavation materials taken off site.</p>

		<p><i>Source: ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011, chapter 4.6.1 page 44\ chapter 4.6.3 page 45\ Environmental Management Plan (PGA), Wind farm Peralta and line, UTE Inabensa Teyma Peralta 08_12, chapter 6.1 page 8.</i></p>	
RA1.7 Provide for Deconstruction & Recycling	8	<p>Superior</p> <p>The expected lifespan of the project is 20 years, but that period may be extended. In the decommissioning phase, the generators will be removed. In the project documentation is stated that after the lifetime of the project, the landscape will be returned to its previous condition. <i>"During the closing program, the following actions will be taken. Removing infrastructural turbine components, avoiding the abandonment of any element alien to the ground; dismantling the step up transformer, considering that it is used exclusively by the Wind Farm; transportation of parts dismantled from its origin to a processing site (authorized to manage iron, steel, copper and aluminum) Environmental recovery of the affected areas after the dismantling of the facilities, including treatment of altered surfaces and re-vegetation of the affected area"</i> (EIA chapter 5.3.1 page 61)</p> <p><i>Source: ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011 chapter 5.3, page 60\ 5.3.1 page 61.</i></p>	<p>* Develop an inventory of materials used in the project that will have potential value for reuse or recycling, considering the effects or time and wear and tear.</p>
RA2.1 Reduce Energy Consumption	0	<p>Non_Applicable</p> <p>This project will consume very little energy. It must be remembered that within an extended property of approximately 1,200 Has., the project concession occupies only 38 Has. Within those boundaries there is only one location of higher consumption: the office area. As a result of these characteristics, the credit is considered to be non-applicable.</p> <p>At this moment, there are no specific initiatives to reduce energy consumption. However, as specified in the PGA, two of the variables monitored monthly will be water and electricity consumption. This could lead to the elaboration of reduction plans in the future.</p> <p><i>Source: Report of request for national approval, wind farm Peralta 06_29_2012, Annex d, "Contribution to Sustainable Development, Peralta Wind farm 03_01_2012" page 4\ Environmental Management Plan (PGA), Wind farm Peralta and line, UTE Inabensa Teyma Peralta 08_12, Annex 2.</i></p>	
RA2.2 Use Renewable Energy	20	<p>Restorative</p> <p>With 25 turbines and a total installed capacity of 50 MW, the project generates a significant net positive amount of renewable energy, which will represent a contribution to Uruguay's energetic goals.</p> <p>One of the main objectives for this country is to diversify the sources for producing electricity and reduce dependency from the supply of other countries. Currently Uruguay relies heavily on hydroelectric power stations that represent 72.71% of the electric energy consumed in the country per year. The productivity of Hydroelectric dams can be affected by changes in the rain pattern. The country also imports oil from other countries, to generate 26, 25% of the electricity consumed per year.</p>	<p>* Evaluate opportunities to use the energy produced by the turbines within the facilities, or consider the viability to incorporate other technologies (such as solar panels).</p>

		<p><i>Source: Report of request for national approval, windfarm Peralta 06_29_2012\ Annex b "Project Design Document (PDD), according to international format approved by the Executive Board. Clean Development Mechanism" page 21, step 4\ \ ATTUO3XM Document prior to public hearing, "Windpark Peralta I" 14 October 2011 chapter 5 pages 8,9 \ \ National Approval Palmatir-LOA - Ministry of Housing, Territorial Planning and Environment, National July 30, 2012.</i></p>	
<p>RA 2.3 Commission & Monitor Energy Systems</p>	<p>11</p>	<p>Conserving</p> <p>Long term monitoring has been planned for the 20 years operation of the Wind Farm. The monitoring allows a more efficient operation and energy production. The maintenance and monitoring processes to follow are clearly stated in the maintenance contract. Two different companies will be in charge of monitoring Wind Farm Peralta. The first one is Epatir SA, which will be the general subcontractor responsible for the maintenance. The second one, Gamesa, as a manufacturer of the turbines, will be responsible for the supervision and maintenance of the generators throughout its lifespan. Those two companies, working together will ensure that the park is running at maximum efficiency.</p> <p>Specific systems are integrated into the monitoring process in order to allow more efficient operations <i>"The maintainer will own and maintain a line of communication available via satellite between its maintenance headquarters and the wind farm, allowing remote access to each AEG"</i> (Turbines Maintenance Contract, clause 3.1.2 "Local operation").</p> <p>During the operation phase a committee will be created. Here the maintenance companies and the project owner will evaluate any possible modification to improvement performance or correct errors. The maximum time in which the installation will be out of operation due to maintenance processes has been calculated. Thus, it is possible to calculate the efficiency of each turbine.</p> <p><i>Source: Report of request for national approval, windfarm Peralta 06_29_2012, Annex b "Project Design Document (PDD), according to international format approved by the Executive Board. Clean Development Mechanism" Section B.7.2 pages 36,37,38 \ Annex 4: Figure 5. Monitoring structure section A.2 page 2.\ \ Turbines Maintenance Contract between Palmatir (owner) and Epartir (maintainer). February 15, 2013, clause 3.1.2 "Local operation" \ clause 3.13, "Technical support and collaboration\ clause 6.2, "Availability guarantee".</i></p>	<p>*Compile the decisions of the committee, in order to have a record of the adjustments in operation.</p> <p>* Analyze how the monitoring process can contribute to a level of operation that exceeds industry standards.</p>
<p>RA3.1 Protect Fresh Water Availability</p>	<p>2</p>	<p>Improved</p> <p>Currently – construction phase - the water is being extracted from an on-site well, mostly for the production of concrete. The water has been extracted from this point without any alteration detected on the water supply of the surroundings. Certain measures have been taken into consideration to reuse water for concrete production. According to the existing environmental control register, between the months of December 2012 and March 2013 the percentage of reused water ranges between 12, 76 to 33.3%. By reusing water, the risk of water resources depletion is reduced.</p> <p>Studies referring to the availability of water resources have not been developed, This kind of assessment is relevant to evaluate maximum volumes that can be consumed sustainably. However, water consumption is expected to decrease drastically after the conclusion of construction phase.</p> <p><i>Source: Environmental Management Plan (PGA), Windfarm Peralta and line, UTE Inabensa Teyma Peralta 08_12; Chapter 4, page 7\ Annex 3- Matrix of significant aspects.</i></p>	<p>* Develop a study of availability of water resources, in order to assess the impact of the construction and operation.</p>

RA3.2 Reduce Potable Water Consumption	0	<p>Non_Achieved</p> <p>There is no information available regarding measures addressed to reduce potable water consumption. Water consumption in the project is expected to be low during the operation phase, since it would be just required for use at the office building. As specified by the project team, the local well will not be used as source for drinking water. For human consumption purposes, all water will be bottled.</p>	<p>*Develop proposals to incorporate water saving strategies in the project.</p>
RA3.3 Monitor Water Systems	1	<p>Improved</p> <p>It is stated that hydrologic connections are not affected by the project. One of the points to monitor, as it has been stated in the PGA's matrix, is water contamination. No impacts have been identified in the last months. A protocol has been created, to clean up the soil in case of oil spills, which could pose a threat for water quality.</p> <p><i>Source: Report of request for national approval, wind farm Peralta 06_29_2012, Annex d) Contribution to Sustainable Development, Peralta Wind farm 03_01_2012, Chapter 3.1.3 page 5,6\ Environmental Management Plan (PGA), Wind farm Peralta and line, UTE Inabensa Teyma Peralta 08_12, Chapter 4, page 6\ Annex 2 – environmental monitoring Plan work Rev.A3 120275 \Annex 3 - Matrix of significant aspects \Monthly monitoring of the Environmental Management Plan (PGA) Feb 2013- March 2013.</i></p>	<p>* Monitor the evaluations of water quality, and implement corrective measures, if that is required.</p>
RA0.0 Innovate Or Exceed Credit Requirements.	0	N/A	
70			

NATURAL WORLD			
	PALMATIR WIND POWER PROJECT – URUGUAY		RECOMMENDATIONS
NW1.1 Preserve Prime Habitat	9	<p>Superior</p> <p>The project is located in a natural area assessed as having low ecological value. It is expected that the impacts of the project on the environment will be small. The analyzed area and the surroundings are dedicated to extensive mixed livestock production on unimproved natural pastures. The operation of the park will not affect animal husbandry – being that an economically compatible activity with the Eolic Park - . It is stated that in the case of negatives impact on the environment, the project must be suspended immediately. “ (...) <i>If environmental impacts not originally foreseen in this process are verified, or if negative results arise in the monitoring, project owners shall immediately suspend the operation of the park and inform the National Environment Directorate, until mitigation measures approved by that office are implemented</i>” (Report of request for national approval, Annex e, item M)</p> <p>The main impacts described as a consequence of the turbines are: the projection of shadows on the houses, physical landscape modification, disk effects (flashes), changes in land use and the changes in air traffic. None of those impacts is connected with prime habitat affection.</p> <p>As it has previously explained, both the visual alteration of the landscape and the projected shadows were assessed as low impacts. Being a Wind Farm development on a land currently used for livestock husbandry, there are no use incompatibilities. Therefore, the impact on pre-existing economic activities null.</p> <p><u>Sources:</u> Report of request for national approval, wind farm Peralta 06_29_2012, Annex b) “Project Design Document (PDD), according to international format approved by the Executive Board. Clean Development Mechanism” page 40 and 41\ Annex d) Contribution to Sustainable Development, Peralta Wind farm 03_01_2012,Chapter 3.1.4, page 6.ª Annex e), “Prior environmental authorizations granted by the MVOTMA”, point “m” \ ATT355PL Preliminary Environmental Assessment LAT line Peralta, 10_ 11_2010,chapter 3.2.1 page 9,10, table page 15, 16 Biological environment \ ATT4352I Environmental Impact Assessment, Tacuarembó has Department, July 2011, chapter 3.1.4 page 14, chapter 3.2.4 page 20.</p>	<p>*Monitor the effects of the Wind Farm on animal husbandry around the project site.</p>
NW1.2 Preserve Wetlands and Surface Water	1	<p>Improved</p> <p>Most of concession area is used for grazing. There are no wetlands or significant surface water bodies within the concession. There is one small river North East of Wind Farm Peralta concession site. To prevent possible impacts related with the construction process, the distance from any given construction to any water body must be at least 25 m “At the same time in Annex 4 is stated that in any case the foundations of the wind turbines will be located at a distance of less than 25 meters from any watercourse, thus avoiding disturbances” (PGA chapter 6.2, page 8). As a result of this buffer area the surface of protected soil and vegetation have increased.</p> <p>The project site is very flat, and there are small streams in the concession site as well as in the distribution line (LAT) area: “With regard to the drainage network, the corridor of the LAT is within the Rio Negro watershed. In its trajectory, it extends over a dense network of drainage, composed of creeks and small streams. The streams crossed by the LAT corridor are (from North to South): Arroyo de los Molles, and Arroyo del Sauce, ending its journey in the sub-station Ricón del Bonete, close to the dam in the Rio Negro.”</p> <p>To prevent ground contamination, as a consequence of residual water spills, there are specific protocols for the cleaning up of the mixers. This protocol is monitored monthly. (PGA annex 2 point 7)</p>	<p>* Monitor the evolution of the buffer areas, in order to guarantee the protection of water bodies.</p>

		<p><i>Sources: Report of request for national approval, wind farm Peralta 06_29_2012, Annex e), "Prior environmental authorizations granted by the MVOTMA", point "f{iii}" \\ ATT3S5PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010, Chapter 3.1.3 Hydrology, pages 8-9, page 16 \\ Environmental Management Plan (PGA), Wind farm Peralta and line (PGA), UTE Inabensa Teyma Peralta 08_12, chapter 6.2, page 8 \\ annex 2 point 17 and 18 \\ annex 3 Matrix of significant aspects.</i></p>	
NW1.3 Preserve Prime Farmland	6	<p>Conserving</p> <p>No soil classified as prime farmland has been occupied or developed. As previously stated, "The land use in the concession area of the Wind Farm, is mainly devoted to pastured lands with few scattered fragments of vegetation" (Environmental and Social Strategy- Draft, Project Description. Page 2).</p> <p>The configuration of the ground is characterized by a much reduced topsoil, due to the fact that the rocks are shallow in the region. As a result the use of the soil as farmland is almost nonexistent</p> <p><i>Sources: Environmental and Social Strategy- Draft, Project Description. Page 2 \\ Report of request for national approval, wind farm Peralta 06_29_2012, Annex d) Contribution to Sustainable Development, Peralta Wind farm 03_01_2012 page 6 \\ ATT3S5PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010 page 9 \\ ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011, page 22.</i></p>	
NW1.4 Avoid Adverse Geology	5	<p>Conserving</p> <p>A geological assessment was developed in September 2011, and has been determined that the site is located in a safe area, suitable for the implementation of the turbines. No adverse geology or natural hazards have been identified. "Most of the land affected by the project is within the group 1.10b [CONEAT]. These lands have varied relief, from mountains with cliffs, to convex slopes, smooth and concave valleys distributed throughout the basaltic region. The rockness and/or stoniness vary from 20-30%, and can exceed 30%." (EIA Chapter 3.1.4 soils, page 14).</p> <p>Some strategies such as maintain a buffer area of 25 meters around water bodies has been implemented to avoid possible damages to the ground.</p> <p><i>Source: ATT3S5PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010, page 8 \\ ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011, chapter 3.1.4 soil page 14, page 22 \\ ATT6AIOG Modification of the Environmental Impact Assessment for the installation of a wind farm in Peralta, Tacuarembó Department, October 11, 2011 \\ Annex I: archaeological research page 4.</i></p>	
NW1.5 Preserve Floodplain Functions	5	<p>Enhanced</p> <p>The construction of the project does not increase flood heights, and neither affects water storage capacity. Alterations in water quality or soil permeability are not expected. The base of the soil in the area is stone, which results in a reduced water storage capacity.</p> <p><i>Source: ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011, chapter 3.1.4 soil page 14 \\ chapter 3.3.2 page 22.</i></p>	

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">NW1.6 Avoid Unsuitable Development on Steep Slopes</p>	<p>6 Conserving</p> <p>The concession area does not has have steep slopes, and therefore, specific measures to prevent erosion and landslides are not required: <i>“The relief within group 12.21 is one of strong hills (3-6% slope) and soft (1-3% slope), with associated concave valleys.”</i> (EIA chapter 3.1.4 page 14)</p> <p>Furthermore, the documentation states that: <i>“Due to the limited earthworks and the reduced footprint of the project, the soil quality will not be modified in any way”</i> (Report of request for national approval, Annex d, page 6).</p> <p><i>Source: Report of request for national approval, wind farm Peralta 06_29_2012, Annex d) “Contribution to Sustainable Development, Peralta Wind farm 03_01_2012” page 6 \\ ATT355PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010 page 15 \\ ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011, chapter 3.1.4 page 14.</i></p>	<p>* Disturbance of areas with slopes must be reduced to the minimum, even if those are not steep.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">NW1.7 Preserve Greenfields</p>	<p>0 Non Achieving</p> <p>The building footprint of the project is small, as is stated in the Report of request for national approval, Annex D, page 6: <i>“The land occupied by the activities connected with the project will add to approximately 38 ha, which represents 3% of the total surface of the considered property”</i>. However, and in spite of this reduced impact, the entire project is being built on an existing greenfield. Therefore, in this variable Wind Farm Peralta does not achieve credits.</p> <p>It is important to reiterate that the National Cartographic Plan assessed that the project area has low ecological relevance.</p> <p><i>Source: Report of request for national approval, wind farm Peralta 06_29_2012, Annex d) Contribution to Sustainable Development, Peralta Wind farm 03_01_2012 page 6 \\ ATT355PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010 page 9, 15 \\ ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011, page 37 change in land use .</i></p>	<p>* Develop compensation strategies related with the occupation of previous greenfields.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">NW2.1 Manage Stormwater.</p>	<p>17 Conserving</p> <p>The storage capacity is expected to remain the same as in the pre-development stage. There will not be significant increases in impervious areas, considering that the only new areas are the tower’s foundations and the office building footprint. In the concession area the water is naturally conducted to existent streams around Wind Farm Peralta. The roads and paths have been built mainly with gravel or with soil allowing rainwater infiltration. After the construction of those paths and during the operation of the wind farm, sedimentation and runoff need to be periodically monitored. (PGA - Annex 3).</p> <p>Furthermore, considering that only part of the roads are new, and that other roads were improved, the possibility of impacts related with runoff further reduces.</p>	<p>* Establish corrective measures to be applied in case that the monitoring process reveals erosion problems.</p>

		<p><i>Source: Report of request for national approval, wind farm Peralta 06_29_2012, Annex b) "Project Design Document (PDD), according to international format approved by the Executive Board. Clean Development Mechanism" page 41\ Annex d) Contribution to Sustainable Development, Peralta Wind farm 03_01_2012 page 6\ ATT355PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010 pages 8,9 y 10 \ ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011 page 43 \ Environmental management plan,(PGA) Wind farm Peralta and line 150 kV Annex 3 - Matrix of significant aspects.</i></p>	
NW2.2 Reduce Pesticides and Fertilizer Impacts	0	<p>Non_Applicable</p> <p>There are no references in the documentation regarding measures to avoid the use of pesticides or fertilizers in the project. Considering that the current land use is predominantly devoted to livestock husbandry the use of pesticides is not necessary.</p>	
NW2.3 Prevent Surface and Groundwater Contamination	4	<p>Enhanced</p> <p>As regards to prevent contamination of groundwater and surface water, a solid waste management plan will be implemented. One of the possible sources of contamination identified is the concrete fabrication process. A way of preventing this contamination, is to have waterproofed areas for washing concrete mixers and a system for effluent treatment.</p> <p>A methodology for cleaning up the area in case of concrete spills has been determined: <i>"In the event of accidental discharges all the spilled concrete and the portion of the soil that was in contact with it should be removed. Later it should be discharged on a general deposit site and then transported to the final disposal site in Paso de Toros, together with other construction waste"</i> (EIA page 40).</p> <p>Another likely cause of surface water or groundwater contamination are oil spills. The spills could be related with the maintenance of the turbines (every 6 months) and the probability of such an event is considered to be low. (EIA page 56).</p> <p>An Environmental Management Plan has been created to ensure proper disposal of liquid and solid waste at the construction phase <i>"There are specific areas for storage and transfer of oil and fuel, with protected ground and adequate containment. These deposits are fenced and have restricted access, so that only authorized personnel trained in the handling of such products can enter"</i> (PGA page 9)</p> <p><i>Sources: Report of request for national approval, wind farm Peralta 06_29_2012, Annex b) "Project Design Document (PDD), according to international format approved by the Executive Board. Clean Development Mechanism" page 41, construction works\ ATT355PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010 page 15 \ ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011 pages 40, 41, 56, 58,59\ Annex I: Report on the impact of Palmatir wind farm on wildlife\ Annex II: Basis of the monitoring plan of aerial fauna\ Environmental Management Plan (PGA), Wind farm Peralta and line, UTE Inabensa Teyma Peralta 08_12 Chapter 8. Chemicals, page 9\ Annex I Environmental objectives of work Rev. A3. 120275 \ Annex II, Environmental Monitoring Plan work Rev.A3 120275; points 4,5,7,11,13 \ Annex III, Matrix of significant aspects.</i></p>	<p>*Establish a long term monitoring system to control water quality.</p>

NW3.1 Preserve Species Biodiversity	2	<p>Improved</p> <p>Several assessments have been conducted to determine the impact of Wind Farm Peralta on local biodiversity (flora and fauna). Different species have been accounted. A possible impact has been established, especially in birds and bats. The main impacts can be summarized as: collisions, disturbances and displacement, barrier effect and habitat destruction. The site of the wind farm is 80km away from the nearest Important Bird Areas (IBA), and this will probably contribute to reduce incidents. Removal of shrubs and trees in areas surrounding the Wind Farm has been proposed, in order to avoid breeding.</p> <p>The mortality of birds by electrocution and collision with cables, as well as the impact on migration routes were considered impacts on medium level. The impact of the high Tension line on the health of animals was also considered to be medium.</p> <p>All of these impacts and consequences must be seen within a general framework into which the site of Wind Farm Peralta is not considered a space of high environmental value. As it has been specified on the EIA (August 2010): "ecological relevance of the area under analysis (August 2010) is considered low [...]"</p> <hr/> <p><i>Sources: Report of request for national approval, wind farm Peralta 06_29_2012. Annex b) "Project Design Document (PDD), according to international format approved by the Executive Board. Clean Development Mechanism" Table 15 EIA conclusions, page 41 \ Annex d) Contribution to Sustainable Development, Peralta Wind farm 03_01_2012, Chapter 3.1.5 page 7 \ \ ATT3S5PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010, Chapter 3.2.2, pages 9,10, 11,17 \ Annex III, Composition and Impact Report on Environment and Birds report. Chapter 3. 4 and 6 \ \ ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 20h11, Chapter 3.2.1 page 15, 16.</i></p>	<p>*Monitor the real impact on birds, bats and other species once the wind farm begins operations.</p>
NW 3.2 Control Invasive Species	0	<p>Non_Applicable</p> <p>There is no available information regarding the introduction of vegetation (either local or exotic) as a result of the project. For this reason, the credit is considered to be non-applicable.</p>	

NW3.3 Restore Disturbed Soils	8	<p>Conserving</p> <p>Construction phase requires earthworks in several areas, which must be totally restored after. In the case of Wind Farm Peralta, soil restoration should be achieved in a 100%, since the soil from excavations is used to cover foundations after concrete is poured.</p> <p>Furthermore, as it is shown on the PGA, during the construction process, soil compaction has been taken into consideration. Proper soil compaction is relevant in order to avoid erosion. In 25 areas close to the generators controls will be done by different means, including a “before and after” photographic record. Areas that have been more affected will be regularly supervised until total recuperation is achieved.</p> <p>Beyond the process of physical restoration, legal and financial measures are required in order to guarantee that the soil will not be affected negatively: “At the beginning of the operation, the project owner shall provide an insurance for the reconstruction of the environment to its previous state after the project’s lifespan is achieved or even if the project has been abandoned. The price and conditions of this insurance must be approved by the National Environment Direction” (Request for national approval Annex e) page 4 clause d.)</p> <p><i>Sources: Report of request for national approval, wind farm Peralta 06_29_2012, Annex d) Contribution to Sustainable Development, Peralta Wind farm 03_01_2012; Annex. e, page 4 clause d \\ ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011, page 51,58 \\ Environmental Management Plan, Wind farm Peralta and line, UTE Inabensa Teyma Peralta 08_12. (PGA) Chapter 6.3 page 8 \\ Annex 1.-Environmental Objectives of Work Rev. A3. 120275. Control and reduce the soil affection \\ Annex .2 – Environmental Monitoring Plan work Rev.A3 120275, point 12 \\ Annex 3.- Matrix of Significant Aspects.</i></p>	*Document the process of soil recovery after the conclusion of construction phase.
	NW3.4 Maintain wetland and surface water functions.	15	<p>Conserving</p> <p>It was assessed that the project does not affect negatively any of the four variables considered in this item: maintenance or enhancement of hydrologic connection, water quality, the function of wetlands and superficial water bodies as habitat [of species], along with maintenance or restoration of sediment transportation.</p> <p>As it has been previously stated, negative impacts on soil permeability and runoff is very low due to the small intervention size in relation with the overall area. Project activities will be concentrated in approximately 38 ha, which represents 3% of the total surface of the concession field.</p> <p>Furthermore, provided documentation states that “the use of wind energy for electricity generation has no incidence on physical or chemical characteristics of water as it produces no contamination affecting this resource, nor discharges [of effluents] or major earthworks. Furthermore, [an adequate] environmental management of the enterprise [will be made] in order to minimize possible spills and dispose waste properly. The possibility of accidental spills of oils is considered low as oil changes occur with little frequency (6 months) and in small quantities. So we can conclude that water resources are not affected [negatively, considering the] baseline scenario” (Report of request for national approval/ annex d/ chapter 3.1.3 pages 5,6)</p> <p><i>Source: Report of request for national approval, windfarm Peralta 06_29_2012, Annex d) Contribution to Sustainable Development, Peralta Windfarm 03_01_2012 chapter 3.1.3 pages 5,6\\ ATT3S5PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010, Chapter 3.1.3 page 8,9.</i></p>
0		N/A	
	78		

CLIMATE AND RISK			
	PALMATIR WIND POWER PROJECT – URUGUAY		RECOMMENDATIONS
CR1.1 Reduce Greenhouse Gas Emissions	25	<p>Restorative</p> <p>The project helps to reduce carbon equivalent emissions and it is considered to be net carbon negative. Wind Farm Peralta will contribute positively to the sustainable development of Uruguay, through a reduction of Greenhouse gas emissions and promoting the diversification of the energy matrix.</p> <p>Wind Farm Peralta will contribute to reduce Uruguay’s dependence on imported petroleum or Hydroelectric power plants. It has been estimated that in a seven years period, Wind Farm Peralta will result in a gas reduction of 815,862 tons of CO2.</p> <p>To determine the accurate reduction in GHG emissions, a monitoring process will be developed according to industry standards. All data collected as part of the monitoring plan will be kept for two years after the last accreditation period.</p> <p>There is a protocol defined by Teyma which is applicable to subcontractors engaged with tasks at Wind Farm Peralta. Periodically, all subcontractors must report CO2 emissions produced by each of these companies, accounting them in the overall emissions of Teyma</p> <p><i>Sources: Report of request for national approval, wind farm Peralta 06_29_2012, Annex b) Project Design Document (PDD), according to international format approved by the Executive Board. Clean Development Mechanism; Table 14 page 35 \ Chapter B.7.2 Description of the monitoring plan, page 36\ Annex d) Contribution to Sustainable Development, Peralta Wind farm 03_01_2012 Chapter 3.1.2 page 5 \ ZPC1108-301_V3_ Public consultation Peralta I and Peralta II projects, 11_ 25_ 2011\Environmental Management Plan, Wind farm Peralta and line, UTE Inabensa Teyma Peralta 08_12. (PGA), Annex 2 – environmental monitoring Plan work Rev.A3 120275, points 14;15;16\ Annex 3 - Matrix of significant aspects\ Agreement for the Implementation of a System of Emissions Reporting Greenhouse Gases.</i></p>	
CR1.2 Reduce Air Pollutant Emissions	12	<p>Conserving</p> <p>The project will contribute positively to the reductions of pollutants such as sulfur dioxide, nitrogen oxides and particulate matter, that result from the use of fossil fuels for power generation.</p> <p><i>“The generation of electricity from wind does not produce toxic gases or greenhouse effect gases, neither it destroys the ozone layer, or contributes to acid rain. It does not create hazardous byproducts or polluting waste. Each Kwh. of electricity generated by wind power instead of coal, prevents [the emission of]: 0.60 kg CO2, carbon dioxide \ 1.33 gr. SO2, sulfur dioxide \ 1.67 gr. NOx, nitrogen oxides”</i> (Report of request for national approval, wind farm Peralta 06_29_2012, Annex d, Chapter 3.1.2 page 5).</p> <p>To prevent particles on the air, some measures such as irrigation of the paths or cover stockpiles areas, have been implemented.</p>	*Monitor the Carbon credits that are generated and commercialized.

		<p><i>Sources: Report of request for national approval, wind farm Peralta 06_29_2012, Chapter A.2 page 2\ Annex d) Contribution to Sustainable Development, Peralta Wind farm 03_01_2012 Chapter 3.1.2 page 5 \ \ ATT3S5PL Preliminary Environmental Assessment LAT line Peralta, 10_11_2010, Table page 16: Aspects and impacts identified in the stage of construction, page 16 \ \ ATT4352I Environmental Impact Assessment, Tacuarembó Department, July 2011; Chapter 4.5.3 page 43\ \ Environmental Management Plan, Wind farm Peralta and line, UTE Inabensa Teyma Peralta 08_12. (PGA), Annex 3 - Matrix of significant aspects.</i></p>	
CR2.1 Assess Climate Threat	0	<p>Non_Achieving</p> <p>No impact assessment or adaptation plan to climate threats has been developed. It would be relevant to have an evaluation of how climate change could affect the project, in order to establish prevention or mitigation strategies, if required.</p>	* Assess possible impacts related with climatic change.
CR2.2 Avoid Traps And Vulnerabilities	16	<p>Conserving</p> <p>Dependence on a non-diversified energy matrix is one of the main vulnerabilities of the country.</p> <p>As it has been previously explained, currently Uruguay's electricity production is based on hydroelectric power plants and on thermoelectric plants fueled with imported oil. The main goal is to change the energy matrix towards a more sustainable and self-sufficient model. In this sense: <i>"The project will contribute positively [...] helping to diversify the country's electricity mix: in March 2011, the 72.71% of the annual electricity generation was from hydro-electric, thermal plants [were responsible for] 26.65% and the remaining 0.64%, [was produced by] wind"</i> (Report of request for national approval/ annex b/ chapter A.2 page 2).</p> <p><i>Sources: Report of request for national approval, windfarm Peralta 06_29_2012, Annex b) Project Design Document (PDD), according to international format approved by the Executive Board. Clean Development Mechanism; Chapter B.2, pages 9,10; step 4, page 21.</i></p>	
CR2.3 Prepare For Long-Term Adaptability	0	<p>Non_Achieving</p> <p>Documentation does not provide information regarding special measures taken to insure that infrastructural systems are resilient to the consequences of long-term climate change. No long term adaptability measures have been put into practice so far.</p>	* Assess feasible long term adaptation measures, to cope with the effects of climatic change.

CR2.4 Prepare For Short-Term Hazards	0	<p>Non_Applicable</p> <p>The hazards assessment applicable to this credit must extend for at least the next 25 years, according to Envision’s matrix. Considering that the lifespan of this project is 20 years, this variable does not apply to the case of Wind Farm Peralta.</p>	
CR2.5 Manage Heat Island Effects	0	<p>Non_Applicable</p> <p>Considering the typology of the project, the management of heat island effect is not applicable to Wind Farm Peralta.</p>	
CR0.0 Innovate Or Exceed Requirements Credit	5	<p>Innovate credit:</p> <p>The implementation of an inventory of greenhouse gases (GHG), was assessed as an initiative worth of an innovate credit. This inventory allows to measure the GHG emissions related to any company or type of activity. As a consequence, this procedure promote awareness within the sector, and the sub constructors implement the procedure in order to obtain their own GHG evaluation of emissions. This system is based on an internal regulation from Abengoa, and is required in all the different construction sites. <i>“The purpose of the inventory is to gain in-depth knowledge of the direct and indirect GHG emissions of each one of our activities, thereby enabling us to: draw up annual reduction plans, label our products and services, and evaluate suppliers according to the GHG emissions associated with the products and services they provide.”</i></p> <p>The inventory will measure direct emissions, associated with sources that are under Abengoa’s control, and also, indirect emissions associated with the generation of acquired thermal or electrical energy. Other indirect emissions associated with the production chain of goods and services acquired by Abengoa. are also accounted.</p>	
	58		
OVERALL:	339	PALMATIR WIND POWER PROJECT – URUGUAY	

10. APPENDIX E: TABLE OF DOCUMENTS

DOCUMENTATION PROVIDED. (ENGLISH)	DOCUMENTACION ENTREGADA (ESPAÑOL)
Report of request for national approval, windfarm Peralta 06_29_2012	Informe Solicitud Aprobación Nacional, Parque Eólico Peralta 29_06_2012
Contribution to Sustainable Development, Peralta Windfarm 03_01_2012	Contribución al Desarrollo Sustentable, Parque Eólico Peralta 03_01_2012
ATT3S5PL Palmatir S.A: Wind farm Peralta - High Voltage, Preliminary Environmental Assessment LAT line Peralta, Tacuarembó Department, October 11, 2010\	ATT3S5PL: Parque Eólico Peralta – Línea de Alta Tensión, Evaluación Ambiental Preliminar LAT Peralta, Departamento de Tacuarembó, 11 de Octubre de 2010.
Annex 3: Composition and Impact Report on Environment and Birds.	Anexo III – Informe de composición e Impacto Ambiental sobre la avifauna.
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