



**Verified Carbon
Standard**

NON-PERMANENCE RISK REPORT LUMIN URUGUAY FOREST PLANTATIONS ON DEGRADED GRASSLANDS UNDER EXTENSIVE GRAZING

Document Prepared by Carbosur

Project Title	<i>LUMIN URUGUAY FOREST PLANTATIONS ON DEGRADED GRASSLANDS UNDER EXTENSIVE GRAZING</i>
Version	<i>01</i>
Date of Issue	<i>01-May-2021</i>
Project ID	<i>960</i>
Monitoring Period	<i>08-April-2013 to 31-December-2020</i>
Prepared By	<i>Carbosur</i>
Contact	<i>Alvaro Pérez del Castillo</i>

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1 INTERNAL RISK

Project Management														
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating												
a)	Species planted are proven to be adapted to the same agro-ecological zone. The proposed project activity will use mostly <i>Eucalyptus grandis</i> and, to a lesser extent, <i>E. dunnii</i> (in low areas where <i>E. grandis</i> can be affected by frost damage, and Loblolly Pine (<i>Pinus taeda</i>) None of these species are native to the area. The choice of species is due primarily to the fact that they ensure an adequate productivity level and a market access for the products to be obtained, which would not be possible if other species were used. The main specie used in the project (<i>E. grandis</i> Hill ex Maiden) is a member of the <i>Myrtaceae</i> family and are not native to Uruguay. However, they originate in regions of Australia with ecological conditions highly similar to those in Uruguay (table below). In addition, Loblolly Pine originates in regions which extend through twelve southern states of USA with ecological conditions highly similar to those in Uruguay. These similarities explain why these two species adapted so well to Uruguayan conditions, where they have been successfully grown and bred for many years. <i>E. grandis</i> was firstly introduced in 1963, brought from South Africa. Whilst <i>P. taeda</i> started to be spread in 1960s (Morey and Porcile). Currently these tree species are among the most widely planted in Uruguay; <i>P. taeda</i> represents approximately 20% (177,469 ha) and <i>E.grandis</i> represents 25% of total commercial plantations in Uruguay according to `Dirección General Forestal`1. The National Institute of Agricultural Research of Uruguay has released a few locally developed varieties of <i>E.grandis</i> and is working on <i>P.taeda</i> to release a local variety. Finally, there are numerous native relatives of <i>Eucalyptus</i> in Uruguay, including more than 20 native tree species belonging to the <i>Myrtaceae</i> family. Comparison of climatic conditions between site of origin and <i>E. grandis</i> project site: <table> <tr> <td></td><td>Conditions in site of origin (<i>Eucalyptus</i> spp.) – Queensland and New Sout Wales, Australia</td><td>Conditions in Uruguay-Treinta y Tres (Uruguay)</td></tr> <tr> <td>Latitude</td><td>26-33° S</td><td>33° S</td></tr> <tr> <td>Annual Precipitation</td><td>1,020-1,780 mm</td><td>1,100-1,300 mm</td></tr> <tr> <td>Mean maximum temperature in January</td><td>29° C</td><td>30° C</td></tr> </table>		Conditions in site of origin (<i>Eucalyptus</i> spp.) – Queensland and New Sout Wales, Australia	Conditions in Uruguay-Treinta y Tres (Uruguay)	Latitude	26-33° S	33° S	Annual Precipitation	1,020-1,780 mm	1,100-1,300 mm	Mean maximum temperature in January	29° C	30° C	0
	Conditions in site of origin (<i>Eucalyptus</i> spp.) – Queensland and New Sout Wales, Australia	Conditions in Uruguay-Treinta y Tres (Uruguay)												
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Mean maximum temperature in January	29° C	30° C												

	<table border="1"> <tr> <td>Mean minimum temperature in July</td><td>2-9 °C</td><td>3-6 °C</td></tr> <tr> <td>Occurrence of frosts</td><td>Occasional, mild</td><td>Occasional, mild</td></tr> </table> The Köppen Climate Classification System, which uses a numerical basis of classification (temperature and precipitation averages), with many zone boundaries determined by the climatic conditions associated with vegetation patterns, defines five major climate groups: both the project region and P. taeda/E.grandis native regions are included in the mild mid-latitude climate (Mcknight, T., Hess, D. 2008). There is no better proof of adaptation than the growing forest in the project area. After 15 years of continuous growth, it is demonstrated that the species are adapted.	Mean minimum temperature in July	2-9 °C	3-6 °C	Occurrence of frosts	Occasional, mild	Occasional, mild	
Mean minimum temperature in July	2-9 °C	3-6 °C						
Occurrence of frosts	Occasional, mild	Occasional, mild						
b)	N/A	N/A						
c)	Project proponent directory has experience to successfully develop any activity related to timber production. In addition, the project developer has a successful and vast experience in forestry. Project management team is very well trained and experienced to successfully develop the project activity. For more information, visit the webpage: https://www.lumin.com/	0						
d)	The management team is based in Uruguay and is located within 5 hours of travel to all areas of the project site. All the management team is based in Uruguay. The headquarters are in Melo, and several staff are located in the project sites. All project areas can be reached by good condition roads, the furthest distance from Montevideo Headquarter represents a travel time of not more than 5 hours (from Montevideo).	0						
e)	The management team includes Carbosur, a climate change consultancy company with more than 18-year experience in carbon projects in the forestry and other sectors Carbosur has been hired by Lumin as the contractor in charge of managing all aspects related to VCS registration, project monitoring and verification. Carbosur has experience with VCS forest projects, having effectively conducted seven afforestation projects through its validation and some of them also with verification. In addition, Carbosur has vast experience with the CDM and VCS, having successfully led the registration of one A/R CDM project (#3845).	-2						
f)	Lumin forest plantations are constantly monitored. The company considers that to have a successful health monitoring, the first step is the early identification of problems. Monitoring by means of permanent plots and reports of trained field staff is what makes possible early detection of potential pests and diseases and nutrient deficiencies. Biomass loss events	-2						

	(both biotic and abiotic) can be immediately detected through the continuous presence of experts in the forests and through the various systematic procedures in place. In addition, the event is registered in a brief document with the purpose of collecting information to prevent the replication of the conditions that caused the pest attacks or plant diseases. Lumin is part of the Health Commission of the SPF (Forest Producers Society), an association created in the year 2009 in order to succeed in the conservation of the forest health status of the country. The responsibilities of this committee are: set the priority works to comply for the year and five-year; approve the research projects of interest to be submitted to the SPF, according to the prioritization of research lines; instruct the coordinator on priorities; develop and monitor the budget in forest health purposes; ensure proper implementation of the annual plans; establish relevant issues in order to include in the agenda of CECOPE (Executive Coordination Committee Pest). In turn, the SPF integrates the Executive Coordination Committee Pest (CECOPE) since 2001, created by order of the Ministry of Livestock, Agriculture and Fisheries. This committee is also made up by the Forestry Bureau (leader), Agricultural Services (ONPF of Uruguay) and the National Agricultural Research Institute (INIA). The Operations Manual (available for the validation team) includes Forest Protection Manual, within which describes health management implemented. Also, Lumin is a member of CAMCORE (Cooperative Forest Genetics Research) which includes the Forest Health Research (http://www.camcore.org/members/members.php). Finally, Lumin has an established process for monitoring progress and documenting lessons learned or corrections that may be needed, and incorporating them into project decision-making in future monitoring periods, e.g. evaluating genetic material, modifying forest management practices, etc.	
Total Project Management (PM) [as applicable, (a + b + c + d + e + f)] Total may be less than zero.		-4

Financial Viability		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	N/A	N/A
b)	N/A	N/A

c)	N/A	N/A
d)	Project cash flow breakeven point is 4 years or less from the current risk assessment	0
e)	N/A	N/A
f)	N/A	N/A
g)	N/A	N/A
h)	Project has secured more than 80% of funding needed to cover the total cash out before the project reaches breakeven. Total cost of purchased land and plantation costs represented more than 80% over the accumulated cash out in Lumin afforestation cash flows. The evidence is demonstrated with the investment done on the field.	0
i)	Project had available as callable financial resources more than 50% of total cash out before project reaches breakeven. This has been demonstrated through the real implementation of the project.	-2
Total Financial Viability (FV) [as applicable, ((a, b, c or d) + (e, f, g or h) + i)] Total may not be less than zero.		0

Opportunity Cost		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	N/A	N/A
b)	N/A	N/A
c)	N/A	N/A
d)	N/A	N/A
e)	N/A	N/A
f)	NPV from project activities is expected to be at least 50% more profitable than the most profitable alternative land use activity. It was demonstrated in the PD that the baseline scenario (extensive beef cattle production) is the only possible alternative land use activity	-4

	within Lumin project boundaries. The IRR of this activity is less than half that expected for the project activity.	
g)	N/A	N/A
h)	N/A	N/A
i)	N/A	N/A
Total Opportunity Cost (OC) [as applicable, (a, b, c, d, e or f) + (g + h or i)]		-4
Total may be less than 0.		

Project Longevity		
a)	Uruguay offers both excellent natural conditions and a very good regulatory framework for the development of forest plantations. Because of this, the country has attracted very important investments in the forestry sector, mostly by foreign capital, in a process that started after the implementation of a specific policy by the Uruguayan government concurred with a very favorable international situation in the late 1980's and early 1990's. There is an important presence of leading global wood products companies in the country. Lumin is the project proponent and the owner with full property rights of the project land, as demonstrated by the notarial certificates available to the validation team. All lands are legally registered in the National Directorate of Land Registry. A notarial deed of incorporation of the companies Lumin is also made available to validation team. The proof of title can be maintained for the entire project longevity. All the project properties are covered by management plans, as stated in the project documents submitted to Uruguayan government. Ecology and nature conservation are two of the company's most important pillars when making investments in timber. Therefore, all properties are being certified by PEFC, which ensures the forest management sustainability. One of the main aims of the certification is to guarantee the long-term commitment of the company. A letter with the commitment to certify the forest plantations in by FSC is made available to the validation team. The sale of land or the conversion of forest to other land uses are not considered as possible sources of income, and it is assumed	24-(120/5)=0

	that the project will continue to operate indefinitely over time. Thus, the project longevity will be established in 120 years. It is important to clarify that the economic analysis (cash flow attached to the PD) includes selling the land at the end of the crediting period (100 years), This assumption was made in order to follow basic economy rules. It does not mean that the land will be actually sold at the year 100 of the project. It is necessary to assume a fixed income for land selling with the aim of obtaining a reasonable Internal Rate of Return (IRR), comparable with the benchmark.	
b)	N/A	N/A
Total Project Longevity (PL) May not be less than zero		0

Internal Risk	
Total Internal Risk (PM + FV + OC + PL) Total may not be less than zero.	0

2 EXTERNAL RISKS

Land Tenure and Resource Access/Impacts		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Ownership and resource access/use right are held by the same entity. Lumin holds full property rights on the land and there are absolutely no disputes over the tenure or use of the land. There are no indigenous groups in Uruguay in general, or in the areas where the project lands are located, in particular. There are no sites of interest to local communities within the premises of the company.	0
b)	N/A	N/A
c)	N/A	N/A

d)	N/A	N/A
e)	N/A	N/A
f)	N/A	N/A
g)	N/A	N/A
Total Land Tenure (LT) [as applicable, ((a or b) + c + d + e + f + g)]		0
Total may not be less than zero.		

Community Engagement		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Local population are not reliant on the project area, the risk is not relevant to the project.	0
b)	N/A	N/A
c)	N/A	N/A
Total Community Engagement (CE) [where applicable, (a + b + c)]		0
Total may be less than zero.		

Political Risk		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	N/A	N/A
b)	N/A	N/A
c)	N/A	N/A
d)	N/A	N/A
e)	Governance score of 0.82 or higher	0
f)	Mitigation: Uruguay has an established Designated National Authority under the CDM (http://cdm.unfccc.int/DNA/index.html?click=dna_forum) and has one registered CDM Afforestation/Reforestation project	-2

Total Political (PC) [as applicable ((a, b, c, d or e) + f)]		0
Total may not be less than zero.		

External Risk	
Total External Risk (LT + CE + PC)	0
Total may not be less than zero.	

3 NATURAL RISKS

Natural Risk (Fire)	
Significance	Insignificant (less than 5% loss of carbon stocks)
Likelihood	Less than 10 years
Score (LS)	2 To assess the natural risk of wildfires in forest plantations, a database provided by Global Forest Watch (GFW) was utilized, cross-referenced with the data on the total forested area from the 2022 Agricultural Statistical Yearbook (DIEA, MGAP). Based on the analysis, it can be observed that between the years 2001 and 2021, the burned forest area resulting from natural wildfires does not exceed 1% of the total forested area during that time period. In the departments of Cerro Largo and Treinta y Tres (project location), a total of 515.7 hectares were burned by natural wildfires between 2001 and 2021, which is an extremely insignificant proportion compared to the total forested area in these departments. It was conservatively assumed a significance of “less than 5%” and likelihood was “less than 10 years”. Combination of both, results in a score of 2.
Mitigation	0.5 Mitigation of risks factor are applied, prevention measures are described in the “Protection Plan Against Forest Fires” (archived as part of the project documentation).

Natural Risk (Pest)	
Significance	Minor (5% to less than 25% loss of carbon stocks)
Likelihood	Every 50 to less than 100
Score (LS)	1 Eucalyptus grandis is one of the most planted eucalypt species in Uruguay, is known to be the least susceptible to pest and diseases in Uruguay's growing conditions. According to Morey and Porcile² (who conducted a thorough historical analysis of pest and disease events in Uruguay) concluded that there were few incidents or losses due to those events: ☐ 1937: first detection of Gonipterus sp. It had reduced impact on biomass losses due to the prompt introduction of its natural enemy in 1941. This insect is present in forest plantations all over the country, but it does not represent a significant threat and it is not declared as a plague. Significance: 4%, assuming conservative values. ☐ 1981: Platypus sp. affecting E. grandis and red gum Eucalyptus in Paysandú (Western Uruguay). It had an important incidence in Populus sp. but it does not significantly affect Eucalyptus sp. Significance: 0% ☐ 1983: Diloboderus abderus larvae affecting young plantations. It did not have any influence on Eucalyptus plantations. Significance: 0% ☐ 1989: in 1932 it was detected by the first time Phoracantha semipunctata. Twelve years later it was declared as a plague in agricultural fields. Damages related to this insect are associated to the occurrence of adverse weather conditions. In the 1989 drought, it was the first and only time when the plague affected forest plantations in the Uruguayan territory; all other diseases and pest were always located on specific sites and weather conditions. There is no official record about the magnitude of the incidence in volume or area affected. According to Morey and Porcile the pest attacked more than 5% of all planted trees in stands larger than 3 ha. Significance: 10%, assuming conservative values. ☐ 1990: Phytophthora ssp and leaf spots diseases. It has not been estimated and it is not possible to determine the real loss value. In the same year, a natural enemy was introduced. Significance: 0% Currently, some other minor diseases could be found (Thaumastocoris, Phoracantha, Botryosphaeria, Puccinia) mainly associated with periods of stress (drought, frosts, high density stands or improper silvicultural management practices). Damages due to these agents are considered as insignificant. Pinus taeda is the most common softwood species planted in Uruguay, is known to be susceptible to a pest (Sirex noctilio) in Uruguay's growing conditions. There is no documentation of historical events that occurred specifically in Pinus taeda plantations. In spite of this, Morey and Porcile³ (who conducted a thorough historical analysis of pest and

	disease events in Uruguay for all types of forest plantations) concluded that there were few incidents or losses in generous Pine: ☐ 1910: appearance of <i>Pissodes notatus</i> in pines at the coast of Maldonado department. It was declares plague in 1921. – Significance:0% ☐ 1955/56: First detections of <i>Rhyacionia buoliana</i> in Soriano and Canelones department. –Significance:0% ☐ 1962: <i>Pissodes</i> attacked plantations in San Gregorio – Significance:5% ☐ 1980: First appearance of <i>Sirex noctilio</i> –Significance:0% • 1981: <i>Rhyacionia</i> attacked young <i>P.taeda</i> plantations – Significance:0% • 1983: Severe attacks of <i>Sirex noctilio</i> (declares plague in 1985) –Significance:10% Currently, other new diseases could be currently found (<i>Fusarium circinatum</i>) or new pests (bark beetles). Damages due to these agents are considered insignificant. Considering the information presented above and the relatively low level of information available at the National or local level, a conservative approach has been applied. The risk of pest and disease outbreak is assumed most significant event (selected value is 10%); and with likelihood of every 50 to less than 100 years.
Mitigation	0.5 In 1995 the Uruguayan Government signed and became part of the Montreal Process which involved the adoption of several indicators and criteria related to the Sustainable Forest Management. Third criterion refers specifically to the Maintenance of Health and Vitality of Forest Ecosystems. Uruguay has freely committed itself to periodically evaluate the evolution of the forest health in time and space and maintain its health. When referring specifically to Lumin, the same procedures are applied within the entire project boundaries: a continuous forest inventory has been implemented which monitors and assessed –among several variables –the actual health of plantations in order to detect in advance any disease spread or plagues attack. The person in charge of project management visiting the project plantations to monitor the health status and observe the possible appearance of pest and disease agents on an almost daily basis.

Natural Risk (Extreme Weather)	
Significance	Insignificant (less than 5% loss of carbon stock) and transient (full recovery of lost carbon stocks expected within 10 years of any event)

Likelihood	Every 10 to less than every 25 years
Score (LS)	1 According to Morey and Porcile, there were 12 extreme weather events during the last 140 years (study done at a National level). Most of them were droughts but also some flood events took place: • 1869/70: Severe drought • 1877/79: drought • 1891/1893: drought • 1903: drought and harvest losses in agriculture fields • 1906/08: drought and lobster invasion (incidence in crops) • 1914: floods • 1915/16: drought and lobster invasion (incidence in crops) • 1942: drought • 1959: floods • 1964/1965: drought • 1988/89: severe drought • 1997/98: severe drought • 2005: severe wind storm • 2009/2010: drought The severity of these events was not measured for the particular case of forests. The only weather condition that directly affected the forest sector was the 2005 wind storm. However, there is no information available on its impacts, which were mostly localized in several spots in the South of the country.
Mitigation	0.5

Score for each natural risk applicable to the project
(Determined by $(LS \times M)$)

Fire (F)	1
Pest and Disease Outbreaks (PD)	0.5
Extreme Weather (W)	0.5
Geological Risk (G)	N/A
Other natural risk (ON)	N/A
Total Natural Risk (as applicable, F + PD + W + G + ON)	2

4 OVERALL NON-PERMANENCE RISK RATING AND BUFFER DETERMINATION

4.1 Overall Risk Rating

Risk Category	Rating
Internal Risk	0
External Risk	0
Natural Risk	2
Overall Risk Rating (a + b + c)	2

4.2 Calculation of Total VCUs

The minimum risk rating is selected (10 percent, according to the Non-Permanence Risk Tool), given the fact that the overall risk rating does not overpass the minimum applicable holding percentage. The amount of VCUs retained in the buffer account can be modified according to subsequent risk assessments at the verification stage.

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)	Buffer pool allocation	VCUs eligible for Issuance
2013	0	629,460	0	629,460	62,946	566,514
2014	0	567,049	0	567,049	56,705	510,344
2015	0	512,530	0	512,530	51,253	461,277
2016	0	419,101	0	419,101	41,910	377,190
2017	0	609,804	0	609,804	60,980	548,823
2018	0	569,968	0	569,968	56,997	512,971
2019	0	694,047	0	694,047	69,405	624,642
2020	0	797,043	0	797,043	79,704	717,339
Total	0	4,799,002	0	4,799,002	479,900	4,319,102