

Supply Base Report: GLOWOOD - INDÚSTRIA, SA

Fourth Surveillance Audit

www.sbp-cert.org



Completed in accordance with the Supply Base Report Template Version 1.3

For further information on the SBP Framework and to view the full set of documentation see www.sbp-cert.org

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1 Overview

Producer name: GLOWOOD - INDÚSTRIA, SA.
Producer location: Parque Empresarial, Lote 1, Expansão 1. Cercal do Alentejo - 7555-999 Santiago do Cacém, PORTUGAL
Geographic position: 37°47'36.1"N 8°41'08.3"W
Primary contact: Natércia Carvalho
 Parque Empresarial, Lote 1, Expansão 1. Cercal do Alentejo - 7555-999 Santiago do Cacém, PORTUGAL
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Company website: <http://www.glowood.pt>
Date report finalised: 06/Jan/2020
Close of last CB audit: 15/May/2019, Cercal do Alentejo.
Name of CB: NEPCon Spain I C
Translation from English: Yes
SBP Standard(s) used: Standard 1 version 1.0, Standard 2 version 1.0, Standard 4 version 1.0, Standard 5 version 1.0
Weblink to Standard(s) used: <https://sbp-cert.org/documents/>
SBP Endorsed Regional Risk Assessment: Not Applicable
Weblink to SBE on Company website: <http://www.glowood.pt/>

Indicate how the current evaluation fits within the cycle of Supply Base Evaluations				
Main (Initial) Evaluation	First Surveillance	Second Surveillance	Third Surveillance	Fourth Surveillance
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

2 Description of the Supply Base

2.1 General description

Glowood – Indústria, SA was founded in May 2011 with the support of IAPMEI through the POalentejo program. Dedicated to the production and marketing of pellets, with strong commitment to the foreign market, since more than 90% of the production is for export.

The company buys roundwood, chips and sawdust, mainly pine (Maritime Pine/*Pinus pinaster* and Umbrella Pine/*Pinus pinea*), as raw material for its manufacturing process. For the drying process, in addition to pine biomass (small logs, bark, waste and leftover), it can also use small roundwood and leftovers of Eucalyptus (*Eucalyptus* spp.) and rarely poplar (*Populus* spp), acacia (*Acacia* spp) and alder (*Alnus glutinosa*), and eventually other species.

All wood comes from forested areas of Portugal, mainly from the districts of Setúbal, Beja, Évora, Lisbon, Portalegre, Santarém, Castelo Branco, Faro, Leiria and Coimbra.

The primary feedstock (roundwood, harvesting waste and other forest waste mainly branches from pruning of umbrella pine) is supplied by approximately 31 companies, mostly small and medium, which are made aware of and controlled in order to obtain the necessary information about the origin of the management unit, with a compromise stated to that effect.

Suppliers who purchase standing timber and carry out their operations, usually make a selection of material, bigger logs for higher end value processes (sawmills) and small logs and leftovers to other processes, including pellets manufacturing and energy production.

This practice is encouraged by the company, with a supply policy to promote the effective use and sustainability of forest resources. The acceptance of larger roundwood is limited (diameter ≤ 40 cm) and there is a formal agreement with a sawmill, located next to the plant, which receives the larger logs delivered by the suppliers, providing in exchange, sawdust and other waste (lumber rejects, chips, small logs etc.).

The secondary feedstock (woodchips and sawdust) comes from suppliers who deliver the material produced (chips) or sawdust resulting from the sawmilling process, essentially from four sawmills, whose wood supply is also from adjacent forest areas in Portugal.

Therefore, the company's supply area remains essentially the continental Portuguese territory.

Thus the company's supply area is restricted to the Portuguese mainland.

In 2019, Glowood produced a total of 62.557,7 t of pellets, with a level of consumption of raw material in the order of 118.339,05.

Portugal has a population of about 9.8 million inhabitants and 8.7 million hectares.

According to data of the last National Forest Inventory (IFN6 – Principais resultados – relatório sumário, ICNF, 2019.), forest, which includes wooded and temporarily not wooded land (cut, burned and regenerating) is the main national land use (36%), representing one of the largest proportions of forested areas in Europe.

The forest of the continent area is dominated by native species, highlighting the oaks (including cork oak and holm oak, about 36% of the total) and pine trees (about 30%). Eucalyptus plantations occupy 26% of the forest area and the rest of the area is distributed by species of lower expression (including *Castanea sativa*, *Arbutus unedo*, *Ceratonia siliqua*, *Acacia* spp, *Poplars*, and others).

National Forest Inventory (IFN6) also presents the following conclusions:

- Forest areas covers 6.1 million hectares (69.4%) of the continental national territory.
- The reducing trend of the forest area, which has been in place since 1995, was reversed in 2015, with an increase of 59.000 ha (1.9%) since 2010 (date of the last Inventory).
- The national forest is mostly composed of native species (72%), some occupying territories larger than their original.
- In structural, functional and landscape terms, the forest of the continent can be organized into four large groups: pine forests (Maritime Pine - *Pinus pinaster* and Umbrella Pine - *Pinus pinea*); perennial hardwoods (cork oak and holm oak); deciduous hardwoods (oaks, chestnut trees and others); and industrial hardwood plantations (*Eucalyptus* spp.).
- The "montado" (perennial hardwoods - cork oak and holm oak) are the main forest occupation, with about 1 million hectares and representing a 1/3 of forest area. Are multi-use forest ecosystems, which do not have wood production as the main function.
- Pine forests are the second forest occupation, with an area close to 825 thousand hectares, with the greatest reduction in the occupied area. The reduction is caused by forest fires and diseases (Mainly the Nematode). However, in the period between 2010 and 2015, the area of, recorded a very significant slowdown in the rate of reducing trend that occurred since 1995 (IFN4), which reveals the extraordinary resilience of these pine forests to disturbances.
- Deciduous hardwood (oaks, chestnut trees and others) are the least representative forest occupation, although there has been a systematic increase over the last 20 years, which is most significant in the period between the last two inventories (2005 and 2015) (46,000 ha; 17%).
- Eucalyptus plantations occupy 844,000 ha, about 26% of the continental forest area and presenting a systematic increase over the last 50 years.
- In 2015, Portugal had 172 million m³ of growing wood, an identical value to what occurred in IFN5 (2005).
- The maintenance of timber volumes between the last two inventories shows that in this period forest production, overall, can be considered sustainable, as wood cuts and losses by fires or pests have been in balance with forest growth. However, this analysis carried out for the main species with woody use reveals a distinct situation.
- The growing wood volume (i.e. of live trees) of Maritime Pine shows a decrease of 30,2 Mm³ compared to the previous IFN, resulting in 2018 51,8 Mm³. The volume of eucalyptus growing wood remains constant since the IFN5 (44 Mm³), despite the area increase of about 58,000 ha. That is, the availability of Maritime Pine is decreasing and eucalyptus wood does not follow its increase in area.

- In terms of wood biomass and carbon stored in living trees in forest areas, there is an increase in both values, resulting from the change in the specific composition of the forest, and partly from the improvement of evaluation methods.
- IFN6 characterizes the state of the forest in 2015 which is necessarily different from its current situation, as a result of the dynamics of forest ecosystems and, in particular, severe rural fires of 2017 and 2018 (Monchique). The impact of these disturbances and the dynamics of deforestation/reforestation and exploitation of resources will be properly assessed in the next IFN, which is scheduled for the start of next year. However, it is possible to make approximate estimates of the consequences of these rural fires on the basis of existing IFN6 data and affected areas. Thus, it is estimated that these fires have affected a forest area of 329,4 thousand ha.

The harvest of Umbrella Pine stands takes a leading role in the forestry economy in some regions, particularly in the south (Alentejo), mainly due to the unique characteristics of its main production (pine nuts for the food industry) which has allowed the rapid development of the umbrella pine envelope, which today occupies an important place in the regional and national economy. In the Alentejo region, about 67% of the national production of pine cone and 15% of world production of pinecone occurs.

According to data from the National Strategy for Forests, forest properties in Portugal are mostly private, with 2.8 million hectares, or 84.2% of the total area owned by family-oriented smallholdings and 6.5 % are owned by industrial companies. Public and community areas correspond to 15.8% of the total, of which only 2% (the lowest percentage in Europe) are the private domain of the State.

The size of the forest estate has a very defined geographical distribution, with a large number of properties located in the north and center of less than 1 hectare in size. It is estimated that there are over 400 000 forest owners in the country.

According to the prospective study for the Forest Sector published by the AIFF (Association for the Competitiveness of Industry Forestry Sector) in 2013, the size of the stands is a key factor in the context of the Portuguese forest, with significant impact on the profitability and sustainability of the activity. In the North and center of the country approximately 54% of this forest area spread over stands of less than 10 ha. The small size of the properties has particular relevance to the two main species whose distribution and harvest are in the central and northern regions:

- In Maritime Pine, 63% of the stands are in areas less than 10 ha and 25% in areas less than 2 ha;
- In Eucalyptus, 50% of forest stands are in properties of less than 10 ha.

Also according to the same study, the Portuguese business structure in the forest industry has some of the most representative European companies in the sector. In the point of view of transactions to the international market for forest and forest-based products, the most important are: paper and cardboard, pulp, cork, wood and resin products and furniture.

The wood sector, particularly softwood for industrial purposes and softwood for sawlogs are essentially based on maritime pine. The pulp, paper and board sector are based mainly on eucalyptus.

According to the Characterization of the Forestry Sector Report 2014 prepared by the AIFF, the trade balance related to the industries of forestry sector had a positive balance of 2,474 million euros in 2013, representing 9.1% of total national exports of goods and 3.4% of the total national imports of goods. The forestry sector represents 2.2% of the total company employees in Portugal and 1.7% of the total employed population.

A breakdown of forestry goods production allows us to observe different trends. The production of maritime pine (softwood for industrial purposes) shows a decrease of 3.6% in value compared to 2011 and for the year 2002 a decrease of 4.5%. In 2012, the production value of wood for sawing was lower than the previous year (-2.3%), due to the price decrease (-2.6%), as the volume has increased (+0.4%) for the third consecutive year;

The production of Eucalyptus (hardwood to mill) maintained the growth trend (interrupted only in 2009), of an increase of 9.2% over the previous year and an increase of 63.4%. This high growth in eucalyptus wood production for industrial use makes this the main forestry goods (representing 36.8%), about 17% higher than the production of softwood for industrial purposes.

Also, according to the AIFF in 2012, the Gross Value Added (GVA) in the forestry increased by 3.9% in volume and 2.4% in value relative to 2011. With regard to the Forestry Production an increase of 4.3% in volume and 3.6% in value in relation to 2011 was recorded. In the same year, the GVA of the forestry sector industries accounted for 1.2% of national GVA, maintaining a significant importance in total manufacturing (11%).

The analysis of GVA by sector reveals a particular negative impact on the timber industry in recent years, with the GVA presenting a reduction of about 40% between 2007 and 2012 (-429 million euros), much lower than reported values for the pulp industry, paper, paperboard and articles thereof (-4%). In the whole period considered (2004-2012) only the sectors pulp, paper, paperboard and articles thereof presents a growth of GVA.

According to Centro PINUS (Association for the development of the Pine Forest), as to recently published data from the INE (National Institute of Statistics), the turnover for pine wood industrial companies in 2018 was 4.137 million Euros, representing an increase of 6% compared to 2017. The pine wood industries maintain a turnover of 46% of the wood manufacturing sector in Portugal. This is evidence as good as any for the powerful dynamism and economic importance of the pine wood industries in Portugal.

According to Pedro Sebastião Perestrelo de Souza e Holstein Campilho in his thesis Assessment of National Potential for Forest Biomass Utilization for Energy Purposes published in 2010, the trend of loss of socioeconomic sustainability of the Portuguese forestry sector in recent years, when supplemented with a conjecture to encourage the production of renewable energy, translates into a set of developments which enhance the demand for biomass from logging residues for energy use. The demand for biomass tends to be met in the short term, in scenarios substantially sustainable. However, in the medium and long term projection, even without considering significant increases in demand for this resource, results in difficulties to meet existing market demands with conditions for sustainability as those experienced in the short term.

The pine forest is distributed throughout the country with Maritime Pine occupying 23% of the forest area of the mainland, mostly located in small areas and Umbrella Pine occupying 6% of the total forest area of continental Portugal, with its main distribution in the south of the country.

Maritime Pine (*Pinus pinaster*) forests are usually managed in stands of trees, generally of seed or seedling origin, that normally develop a high closed canopy, and can be managed using natural regeneration or by sowing or planting.

In cases of natural regeneration and planting, the initial phase is intended to gradually reduce the density of plants to 1200-1600 trees / ha. Initially in groups and then selectively with mechanical or manual harrowing or slashing. After 10 years the trees can be pruned (1-2) and thinned (2-3) utilizing the residual material, leaving a final cut (30-40 years) of about 500-600 trees / ha, while proceeding to also control unwanted vegetation mechanically or manually harrowing or slashing. In the case of natural regeneration, during the final cut about 25 large trees / ha are left as seed trees.

In the case of a plantation, the ground is prepared with disking, ripping and harrowing along the contours in areas with slopes up to 30%, on steeper slopes the site preparation and planting is manual. The planting density depends on the site condition, usually 1200 to 1600 seedlings / ha.

After 10 years the trees can be pruned (1-2) and thinned (2-3) utilizing the residual material, leaving a final cut (30-40 years) of about 500- 600 trees / ha, while proceeding to also control unwanted vegetation mechanically or manually harrowing or slashing. In the case of natural regeneration, during the final cut about 25 large trees / ha are left as seed trees.

In Umbrella Pine (*Pinus pinea*) silviculture, the intertree distance at planting depends on the future purpose of the stand: production of wood or cones (pine nuts).

For the production of wood intertree distances of 4x3 m. are used to promote natural pruning. The distance between rows should allow the passage of agricultural machines mainly used for brushing. In stands oriented to cone production (with or without using grafting technique), the trees should grow in favorable light and ventilation, in order to develop large canopies that favor the production of pine cones. The most commonly used intrertree distance is (5x5), but also (6x5), (6x6) and (8x6) are used.

In areas well-adapted for Umbrella Pine, natural regeneration can be used. The natural regeneration results in a high number of plants per hectare. Thus a selection of the best developed plants must be done promptly.

Stand tending is done through pruning and thinning's that produce considerable amount of woody material. The first pruning should occur after 5-6 years after planting. The 2nd pruning should occur between 10 and 12 years, taking into account the development of the stand. This pruning often coincides with the 1st thinning. The 3rd pruning is between 20 and 25 years, coinciding with the 2nd thinning. The final cut is usually done after 40 years.

Eucalyptus silviculture (mainly *E. globulus*) is based on planting and the clear-cutting the forest, usually between 10 and 15 years, utilizing all of the wood with or without the bark (simple coppice). Priority is given to conducting coppice for 1, 2 up to 3 rotations, selecting shoots after each cut. If last cut is not deemed productive then the area is re-planted.

In mixed stands with Maritime Pine, the system is based on thinning the forest in order to leave a percentage of remaining trees for future use when the stumps of the harvested Eucalyptus trees produce shoots (composed coppice)

Planting of eucalyptus starts with the site preparation, which normally consists of destroying and incorporating existing woody material, followed by tillage (disking, ripping, and harrowing).

Fertilization depends on the site and the owner conditions. The planting is carried out to a density typically between 1100 and 1300 seedlings per hectare. Between the second and sixth year a second fertilization and competing vegetation control is recommended.

The selection of shoots is made during the second and third year, maintaining a number of stems per hectare corresponding to the initial density of planting.

In most cases, the harvest occurs between 10 and 15 years. The basic logging operating system consists of utilizing a tractor processor and a tractor loader, and usually manual felling with a chainsaw.

The Poplar is currently cultivated on a small scale. Given the nature of the soil (deep and wet), site preparation is done in late summer or early autumn. The intertree distance commonly used is 4x4 meters. The 1 year old plants from cuttings are planted as deep as possible (0.5 meters) in order to develop a good root system.

Usually there is a heavy competition from weeds that requires manual weeding two times, complemented with shallow harrowing during the first four years. During the first 3 to 4 years it is very important to carry out pruning, to prevent forking and add value to the wood, whose final use are veneer.

The Poplar can be managed in coppice, with clear cuts made from 14 years, or usually older, depending on the purpose and final use opportunities.

Acacia is an invasive species in Portugal, appearing in pure or mixed formations, and it is not permitted to plant and cultivate. However, using it is allowed.

The Forest Management Plan (FMP) is a planning instrument within the legal framework provided by the Forest Policy Framework Law (Law No. 33/96 of August 17) and later by Decree-Law No. 16 / 2009 of January 14, which approves the legal framework of management plans, management and interventions of forest areas (repealing Decree-Law No. 205/99 of June 9, which governed the elaboration process, approval, implementation and modification of FMPs to be applied to forest areas).

The dynamics of the FMP development processes and the PEIFs (Specific Plans for Forest Intervention) in a more general way to private and public forest areas is still young, having started with the approval of the Regional Forest Management Plans (PROF) in 2006-2007, reinforced with the conditions of having the FMPs approved as eligibility criteria for access to support for forest investment programs under the PRODOR, together with the development of forest certification processes.

In November 2018 (date of the last information available from ICNF), there were more than 3.000 PGF approved (1,72 million ha), representing 31% of the forest area of Continental Portugal.

In Portugal it is not necessary to have specific authorization for harvesting except for cork oak, holm oak and logging in protected or classified areas. When harvesting softwoods (Pine and others) it is necessary to produce a harvest manifest, pruning and transport of coniferous wood (Decree-Law 123/2015 of 3 July), which concerns the application of the extraordinary measures of plant protection essential to the control of the pine wood nematode (PWN).

CITES – (Convention on International Trade in Endangered Species of Wild Fauna and Flora) not includes timber species on the lists for Portugal and Spain.

Map of the infrastructure of National Protected Areas:

âmbito nacional

Parque Nacional

1 Peneda-Gerês

Parques Naturais

- 2 Montesinho
- 3 Litoral Norte
- 4 Alvão
- 5 Douro Internacional
- 6 Serra da Estrela
- 7 Tejo Internacional
- 8 Serras de Aire e Candeeiros
- 9 Serra de São Mamede
- 10 Sintra-Cascais
- 11 Arrábida
- 12 Sudoeste Alentejano e Costa Vicentina
- 13 Vale do Guadiana
- 14 Ria Formosa

Reservas Naturais

- 15 Dunas de São Jacinto
- 16 Serra da Malcata
- 17 Paul de Arzila
- 18 Berlengas
- 19 Paul do Boquilobo
- 20 Estuário do Tejo
- 21 Estuário do Sado
- 22 Lagoas de Santo André e Sancha
- 23 S.C.Marim - V.R.S.António

Paisagens Protegidas

- 24 Serra do Açor
- 25 Arriba Fossil da Costa da Caparica

Monumentos Naturais

- 26 Cabo Mondego
- 27 Portas de Ródão
- 28 Pegadas de Dinossáurios de Ourém/Torres Novas
- 29 Carenque
- 30 Pedra da Mua
- 31 Lagosteiros
- 32 Pedreira do Avelino

âmbito regional/local - DL 19/93

Paisagem Protegida

- 33 Albufeira do Azibo
- 34 Corno do Bico
- 35 Lagoas de Bertandos e São Pedro de Arcos
- 36 Serra de Montejunto

âmbito regional/local - DL 142/2008

Parque Natural Regional

37 Vale do Tua

Reserva Natural Local

- 38 Paul da Tornada
- 39 Estuário do Douro

Paisagem Protegida Regional

- 40 Litoral de Vila do Conde e Reserva Ornitológica do Mindelo
- 41 Serra da Gardunha

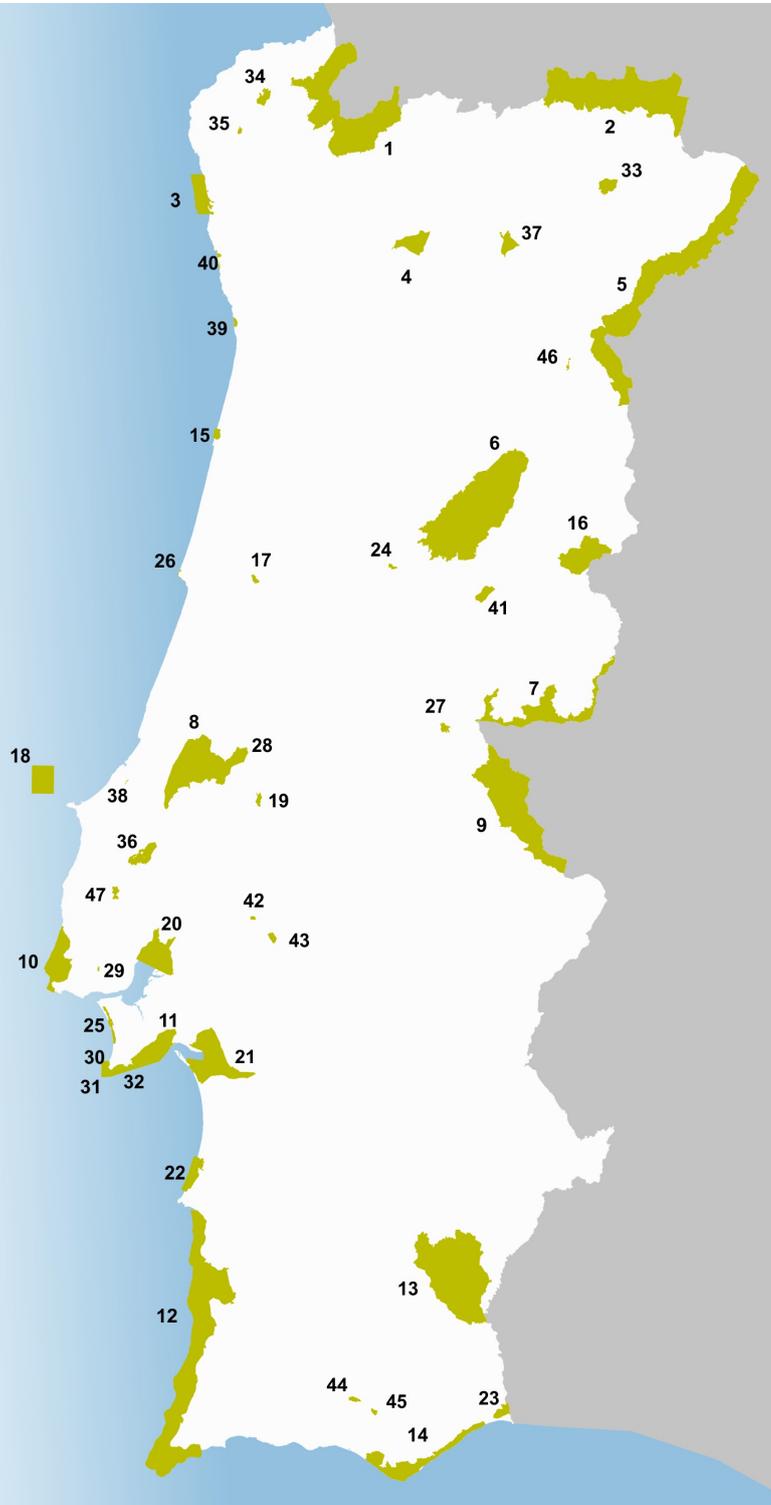
Paisagem Protegida Local

- 42 Açude da Agolada
- 43 Açude do Monte da Barca
- 44 Rocha da Pena
- 45 Fonte Benémola
- 47 Serras do Socorro e Archeira

âmbito privado

Área Protegida Privada

46 Faia Brava



Product Group	Certification	N° Suppliers	Input Group	Format	Species	Quantity (t)	%
Controlled Feedstock	FSC CW (*)	31	Primary feedstock from forests (products or residues)	Roundwood	Maritime pine, Umbrella pine, Acácia, Poplar	28.902	22,8
			Primary feedstock from forests (products or residues)	Roundwood	Eucayptus	5587,58	4,41
			Primary feedstock from forests (products or residues)	Wood chips	Maritime pine, Umbrella pine	17.295,32	13,64
			Wood industry residues (secondary feedstock)	Wood chips Sawdust Wood offcuts	Maritime pine	16.587,16	13,08
SBP-compliant Primary Feedstock	FSC SBP	6	FSC 100%	Roundwood, Chips	Eucayptus, Maritime pine, Umbrella pine	14.904,94	11,76
		11	SBP			43.491,08	34,31

(*) Non-certified material controlled under the company's Chain of Custody Management System, which is certified according to the FSC-STD-40-005 Standard for Company Evaluation of FSC Controlled Wood.

2.2 Actions taken to promote certification amongst feedstock supplier

The company has contacted each of its suppliers and affirmed the importance of providing certified material (FSC or PEFC), pointing out the increasing demands of markets and consumers regarding the legal and sustainable source of forest products, including biomass for energy production.

The implementation of the **Supplier Qualification and Control Program** is also considered an important action in the sense of promoting forest certification, since the qualification of the suppliers represents the fulfillment of several requirements applicable to the certification, also having as support Good Practice Guides, applicable to both suppliers and forest producers and managers, which have been drafted and have been distributed.

Qualified suppliers have their legal status proven, practice and propagate Good Forest Practices, collect and send prior information about the area of origin of the material to be supplied and are subject to **Glowood's** follow-up and control actions.

The person responsible for the **Supplier Qualification and Control Program** has also informed the producers and forest owners that added value is gained by managing their areas as certified, either individually or through group initiatives recognized by the company.

In addition, the company's employees have participated in events related to management and forest certification, trying to gather information and give their contribution to the development of the subject, especially in Portugal.

2.3 Final harvest sampling programme

In 2019, it is estimated that 24,95

% of wood material consumed may have originated in final fellings, being 4,52 % from stands with an expected rotation length of more than 40 years, according evaluation made on reception of the material. It refers essentially to the Pine roundwood, especially of Umbrella Pine (*Pinus pinea*) managed with main objective of producing cones (pine nuts).

2.4 Flow diagram of feedstock inputs showing feedstock type [optional]

N.A

2.5 Quantification of the Supply Base

Supply Base

- a. Total Supply Base area: 3.224 million ha
- b. Tenure by type: Private: 3,13 million ha (97%, including 8% communitarian)
Public: 94.000 ha (3%)
- c. Forest by type: Temperate: 3.224 million ha
- d. Forest by management type: Plantations: 845.000 ha; Natural/ Semi natural: 2.379 million ha
- e. Certified forest by scheme (ha): FSC: 472.983 ha PEFC: 277.679 ha

Feedstock

- f. Total volume of feedstock: 0 – 200.000 t (126.768,08 t)
- g. Volume of primary feedstock: 0 – 200.000 t (110.180,92 t)
- h. Percentage of primary feedstock:
 - Certified to an SBP-approved Forest Management Scheme: 11,76 % (14.904,94 t)
 - Not certified to an SBP-approved Forest Management Scheme: 88,24 %
- i. List all species in primary feedstock, including scientific name:
 - Maritime pine (*Pinus pinaster*)
 - Umbrella pine (*Pinus pinea*)
 - Eucalyptus (*Eucalyptus spp*)
 - Poplar (*Populus spp*)
 - Acacia (*Acacia spp*)
 - Cypress (*Cupressus spp*)

- j. No feedstock from primary forest.
- k. Primary feedstock from primary forest certified to an SBP-approved Forest Management Scheme - 11,76 %
Primary feedstock from primary forest not certified to an SBP-approved Forest Management Scheme – 88,24 %
- l. Volume of secondary feedstock: 16.587,16 t (13,08 %)
- m. No tertiary feedstock

For the following year, we intend to maintain the supply profile from 2020, maintaining or increasing the consumption of primary feedstock.

With the company's continued efforts to encourage the supply of certified source material (FSC or PEFC), it is expected that the volumes registered for these material categories will increase. In 2019 has been received more than double the amount purchased in 2018, representing about 2 times more in percentage terms.

With the certification according to the Standard 1: Feedstock SBP Compliance Standard, we intend to maintain and expand the income of "SBP compliant" feedstock. In 2019 has been received more than triple the amount purchased in 2018, representing about 4 times more in percentage terms.

3 Requirement for a Supply Base Evaluation

SBE completed	SBE not completed
X	<input type="checkbox"/>

Most of feedstock is not FSC nor PEFC certified, which results in a need for a Supply Base Evaluation to enable the supply of SBP compliant pellets.

4 Supply Base Evaluation

4.1 Scope

Primary feedstock originating from forests located in Portugal, mainly the districts of Setúbal, Beja, Évora, Lisbon, Portalegre, Santarém, Castelo Branco, Faro, Leiria and Coimbra, provided by qualified suppliers under Glowood's **Supplier Qualification and Control Program**. In 2018 it was also made a small experience using chips of *Cryptomeria* (*Cryptomeria japonica*) from São Miguel Island, Azores.

4.2 Justification

The Supply Base Evaluation is justified by the company's intention to increase pellet production with the "SBP compliant" biomass claim, considering the insufficient supply of FSC and PEFC certified primary feedstock in national market.

4.3 Results of Risk Assessment

While the Regional Risk Assessment (RRA), which is being carried out by the Working Group created under Technical Committee 145 of the Portuguese Quality Institute (IPQ), and coordinated by AIMMP (Associação das Indústrias de Madeira e Mobiliário de Portugal), is not yet completed and endorsed by SBP, the first Regional Risk Assessment made in 2016 on request by ANPEB (Associação Nacional de Pellets Energéticos de Biomassa – Actually integrated on AIMMP) was considered for this SBE, which was made in accordance with the requirements of the SBP, for primary feedstock originating from Portugal mainland, presenting 13 indicators with specified risk:

- 2.1.1 - Forests and other areas with high conservation value in the Supply Base are identified and mapped.
- 2.1.2 - Potential threats to forests and other areas with high conservation values (HCV) from forest management activities are identified and managed. (HCV 1, HVC 3, HCV4 e HCV5)
- 2.1.3 - Feedstock is not sourced from forests converted to production plantation forest or non-forest lands after January 2008.
- 2.2.1 - Feedstock is sourced from forests where there is appropriate assessment of impacts, and planning, implementation and monitoring to minimise them.
- 2.2.2 - Feedstock is sourced from forests where management maintains or improves soil quality (CPET S5b).
- 2.2.3 - Key ecosystems and habitats are conserved or set aside in their natural state (CPET S8b).
- 2.2.4 - Biodiversity is protected (CPET S5b).

- 2.2.6 - Negative impacts on ground water, surface water and water downstream from forest management are minimized. (CPET S5b).
- 2.4.1 - The health, vitality and other services provided by forest ecosystems are maintained or improved (CPET S7a).
- 2.4.2 - Natural processes, such as fires, pests and diseases are managed appropriately(CPET S7b).
- 2.5.1 - Legal, customary and traditional tenure and use rights of indigenous people and local communities related to the forest are identified, documented and respected (CPET S9)
- 2.8.1 - Appropriate safeguards are put in place to protect the health and safety of forest workers(CPET S12)
- 2.9.1 - Biomass is not sourced from areas that had high carbon stocks in January 2008 and no longer have those high carbon stocks.

4.4 Results of Supplier Verification Programme

NA.

4.5 Conclusion

The main conclusion of the Glowood Supply Based Assessment indicates that the company, through its **Supplier Qualification and Control Program**, is able to **ensure** the supply of primary feedstock with indicators as low risk, thus suitable for production of pellets with SBP compliant claim.

To date, the Program has produced the following results:

- Training of 21 suppliers
- 18 qualified suppliers
- 27 Monitoring Audits (Primary Feedstock) in 2019
- 63 supplies with Information of Origin of the Forest Material, totalling 43.491,08 tons of primary feedstock in 2019

The main indicators for which it was not possible to assess the risk as low were:

- 2.1.2 – 1 situation without approved Forest Management Plan (PGF)
- 2.1.3 - 1 situation of intensive thinning resulting in a non forest use area
- 2.1.3, 2.2.1 and 2.2.2 - 1 situation of intensive thinning resulting in a non forest use area and significant impacts on soil
- 2.2.2 e 2.9.1 – 3 situations from felling and thinning followed by stump remove with significant impacts on soil quality and carbon storage

5 Supply Base Evaluation Process

The Glowwood Supply Base Evaluation was carried out by a team defined and coordinated by the Integrated System Manager (GSI), with expertise and experience in topics related to the specified risks and the defined mitigation measures, including ISO 9001 and 14001 certifications, ENplus, FSC, PEFC and SBP.

As mentioned above, was considered the first National Risk Assessment made upon request of ANPEB, in accordance with the requirements of the SBP.

For the 13 indicators with specified risk, mitigating measures and respective means of verification were defined.

The **Supplier Qualification and Control Program** involves now 18 primary feedstock suppliers, which enables 34,31 % of primary feedstock for pellets SBP compliant biomass production in 2019.

The Good Practice Guidelines, applicable to suppliers and property owners and managers, as well as forms for collecting and sending information, are still being used.

Qualified suppliers have their legal status proven, practice and propagate Good Forest Practices, collect and send prior information about the area of origin of the material to be supplied and are subject to **Glowood's** follow-up and control actions.

For each supply area, the qualified supplier must collect the necessary information, in conjunction with the forest owner and/or responsible for the area, by filling in a form designed for this purpose, which is sent to **Glowood**.

Based on the information received, the Glowwood personal evaluate the framework and identify any aspects to be verified and confirmed to ensure compliance with mitigating measures and the respective risk assessment.

Glowood personal should ensure that the area is perfectly identified and that, depending on the situation, be consulted the various sources that are referenced in the risk assessment, which have information to conclude about risk indicators and to establish possible mitigating measures.

The analysis of information and consultations can lead to the following situations:

- **Disqualification of material:** in the case of confirmed specific risk for at least 1 indicator. (Example: indication that the area is not replanted after harvest – Indicator 2.1.3)
- **Need for conduct specific field audit:** in the case of doubtful situations or requesting more information or confirmation. (Example: difficult to accurately locate the area; Indication of the presence of important natural areas, invasive species, pests or diseases, signs of erosion, information from stakeholders, etc.)
- **Low risk classification:** in the case of no indication that raises questions, including the consultation sources.

The **Supplier Qualification and Control Program** includes a monitoring plan, based in field audits to a sample of suppliers, taking into account their activity in the previous year, to confirm the origin of the material, the effectiveness of mitigating measures and, in the end, the risks evaluation.

Once chosen the suppliers to monitor, origin areas of the material provided as "SBP-compliant" are identified, taking into account the supply frequency, quantity, characteristics of the sites and the type of material provided.

Monitoring audits are made by expertise personal with experience in the issues related to specified risks and mitigating measures defined, being recorded the details and evidence, the conclusion about the risk and possible corrective actions, taking account of the criteria and guidelines established on SBP standards and other applicable requirements.

6 Stakeholder Consultation

The Supply Base Evaluation, including the Risk Assessment and the Supplier Qualification and Control Program, was subject to a public consultation, launched on October 2, 2017, in order to gather contributions to consolidate or improve the Evaluation.

The consultation was done by e-mail, and more than 60 interested parties were contacted, including Authorities, Municipalities, Town Councils, Representative Entities, Teaching Institutions, Producer Associations, Companies, Service Providers, Clients, Specialists, Fire Department and Unions.

6.1 Response to stakeholder comments

So far only one response has been received, and the respective stakeholder declared to have no competence in risk assessment and qualification and control of suppliers, and therefore could not comment.

7 Overview of Initial Assessment of Risk

The National Risk Assessment made upon request of ANPEB, in accordance with the requirements of the SBP, for primary feedstock originating in the mainland of Portugal, identified 13 indicators with specified risk:

Table 1. Overview of results from the risk assessment of all Indicators (prior to SVP)

Indicator	Initial Risk Rating		
	Specified	Low	Unspecified
1.1.1		X	
1.1.2		X	
1.1.3		X	
1.2.1		X	
1.3.1		X	
1.4.1		X	
1.5.1		X	
1.6.1		X	
2.1.1	X		
2.1.2	X		
2.1.3	X		
2.2.1	X		
2.2.2	X		
2.2.3	X		
2.2.4	X		
2.2.5		X	
2.2.6	X		
2.2.7		X	
2.2.8		X	
2.2.9		X	

Indicator	Initial Risk Rating		
	Specified	Low	Unspecified
2.3.1		X	
2.3.2		X	
2.3.3		X	
2.4.1	X		
2.4.2	X		
2.4.3		X	
2.5.1	X		
2.5.2		X	
2.6.1		X	
2.7.1		X	
2.7.2		X	
2.7.3		X	
2.7.4		X	
2.7.5		X	
2.8.1	X		
2.9.1	X		
2.9.2		X	
2.10.1		X	

8 Supplier Verification Programme

8.1 Description of the Supplier Verification Programme

NA.

8.2 Site visits

NA.

8.3 Conclusions from the Supplier Verification Programme

NA.

9 Mitigation Measures

9.1 Mitigation measures

Supplier Qualification and Control Program includes the following mitigation measures and respective means of verification, for each of the indicators considered with specified risk.

2.1.1 - Forests and other areas with high conservation value in the Supply Base are identified and mapped.

- Suppliers Qualification and Control Program (PSI 16 -Programa de Qualificação e Controlo Fornecedores), including consultation of cartography and others information sources, and verification that forests and other areas with high conservation values (HCV), specifically HCV 1.2, HCV 1.3, HCV 1.4 and HCV 3, are identified and mapped.
- Disqualify material coming from areas where high conservation values are not identified and mapped.

Means of Verification:

- Checklist completed by the supplier/forest owner
- Location and consultation of information and cartography

2.1.2 - Potential threats to forests and other areas with high conservation values (HCV) from forest management activities are identified and managed. (HCV 1, HVC 3, HCV4 e HCV5)

- Consultation of information sources regarding HCVs.
- Procedures for conduct specific field audits to identify and address real and potential threats to forests and other areas with high conservation values, specifically HCV 1, HCV 2, HCV 3 and HCV 4, which were previously identified and mapped.
- Disqualify material coming from areas where forest management and operations represent evident threats to HCV 1, HCV 2, HCV 3 and HCV 4.
- Promotion of Good Forest Practices
- Monitoring plan

Means of Verification:

- Checklist completed by the supplier/forest owner
- Location, consultation of information sources and identification of constraints established for areas
- PGF (Forest Management Plan) or project approved, when applicable
- Forest authority (ICNF) document, when applicable
- Field Audit

2.1.3 - Feedstock is not sourced from forests converted to production plantation forest or non-forest lands after January 2008.

- Consultation of historical information sources and information from stakeholders
- Analysis of owner's information regarding the past and future area's covering and use.
- Procedures to conduct monitoring field audits to verify if feedstock is or is not sourced from forests converted to production plantation forest or non-forest lands after January 2008.
- Disqualify material coming from areas where natural forest were converted into Eucalyptus or other plantation from 2008, or to be converted with Eucalyptus or other plantation, or transformed into pasture, agriculture or other non-forest use;
- Promotion of Good Forest Practices
- Monitoring plan

Means of Verification:

- Checklist completed by the supplier/forest owner
- Location and consultation of the owner and stakeholders
- Field Audit

2.2.1 - Feedstock is sourced from forests where there is appropriate assessment of impacts, and planning, implementation and monitoring to minimise them.

- Consultation of information sources and legislation regarding impact assessment.
- Analysis of information from the area regarding social and environmental aspects
- Procedures for conduct field audits to verify social and environmental aspects and the appropriate assessment, planning and implementation of measures for minimise real or potential impacts, especially in case of clear cuttings made over a specific size area, defined regionally by each Regional Forest Plan (PROF), as the maximum clearcutting area or the size of even aged monoespecific forest stand.
- Disqualify material coming from areas where no appropriate assessment of impacts, and planning, implementation and monitoring to minimise them, is confirmed;
- Promotion of Good Forest Practices
- Monitoring plan

Means of Verification:

- Checklist completed by the supplier/forest owner
- Consultation of Regional Forest Plans (PROF)
- Field Audit

2.2.2 - Feedstock is sourced from forests where management maintains or improves soil quality (CPET S5b).

- Consultation of information sources and legislation related with soil aspects
- Analysis of information from the area regarding soil erosion.
- Procedures for conduct field audits to verify if forest management maintains or improves soil quality, especially in forest lands located on desertification susceptible area according to Forest Services (ICNF) cartography and with size above minimum size required for Forest Management Plan in respective PROF.
- Disqualify material coming from areas where is confirmed that forest management do not maintains or improves soil quality.
- Promotion of Good Forest Practices
- Monitoring plan

Means of Verification:

- Checklist completed by the supplier/forest owner
- Consultation of Forest authority (ICNF) cartography and Regional Forest Plans (PROF)
- Field Audit

2.2.3 - Key ecosystems and habitats are conserved or set aside in their natural state (CPET S8b).

- Consultation of information sources regarding biodiversity
- Analysis of information from the area regarding biodiversity.
- Procedures for conduct specific field audits to identify and address real and potential threats to conservation of key ecosystems and habitats.
- Disqualify material coming from areas where forest management and operations represent evident threats to conservation of key ecosystems and habitats.
- Promotion of Good Forest Practices
- Monitoring plan

Means of Verification:

- Checklist completed by the supplier/forest owner
- Location, consultation of information sources and identification of conditions established for concerned areas, ecosystems and habitats.
- PGF (Forest Management Plan) or project approved, when applicable
- Forest authority (ICNF) document, when applicable
- Field Audit

2.2.4 - Biodiversity is protected (CPET S5b).

- Consultation of information sources regarding biodiversity.
- Analysis of information from the area regarding biodiversity.
- Procedures for conduct specific field audits to identify and address real and potential threats to protection of biodiversity.
- Disqualify material coming from areas where is confirmed that forest management and operations do not ensure that biodiversity is protected.
- Promotion of Good Forest Practices
- Monitoring plan

Means of Verification:

- Checklist completed by the supplier/forest owner
- Location and consultation of information sources.
- PGF (Forest Management Plan) or project approved, when applicable
- Forest authority (ICNF) document, when applicable
- Field Audit

2.2.6 - Negative impacts on ground water, surface water and water downstream from forest management are minimized. (CPET S5b).

- Consultation of information sources and legislation related with water.
- Analysis of information from the area regarding soil erosion.
- Procedures for conduct field audits to verify if forest management maintains or improves soil quality, especially in case of clear cuttings at dimensions above to the maximum area indicated for each region by PROF (Regional Forestry Management Plan), in areas which are not managed by ICNF.
- Disqualify material coming from areas where is confirmed that forest management do not minimise negative impacts on ground water, surface water and water downstream.
- Promotion of Good Forest Practices
- Monitoring plan

Means of Verification:

- Checklist completed by the supplier/forest owner
- Location and consultation of information sources and Regional Forest Plans (PROF)
- PGF (Forest Management Plan) or project approved, when applicable
- Field Audit

2.4.1 - The health, vitality and other services provided by forest ecosystems are maintained or improved (CPET S7a).

- Consultation of information sources regarding biotic and abiotic risks for the ecosystems services.
- Analysis of information from the area regarding biotic and abiotic risks.
- Procedures to access information from the area regarding biotic and abiotic risks, and procedures for conduct monitoring field audits to verify ecosystems services, social and environmental aspects and the appropriate assessment, planning and implementation of measures for minimise real or potential risks and impacts.
- Disqualify material coming from areas where health, vitality and other services provided by forest ecosystems are not maintained or improved;
- Promotion of Good Forest Practices
- Monitoring plan

Means of Verification:

- Checklist completed by the supplier/forest owner
- Location and consultation of information sources.
- PGF (Forest Management Plan) or project approved, when applicable
- Field Audit

2.4.2 - Natural processes, such as fires, pests and diseases are managed appropriately(CPET S7b).

- Consultation of information sources and legislation regarding natural processes (fires, pests, invasive species, and diseases).
- Analysis of information from the area regarding invasive species, diseases, resources for fire prevention and protection
- Procedures for conduct field audits to verify these aspects if necessary.
- Disqualify material coming from areas where natural processes, such as fires, pests and diseases, are not managed appropriately.
- Promotion of Good Forest Practices
- Monitoring plan

Means of Verification:

- Checklist completed by the supplier/forest owner
- Location and consultation of information sources.
- PGF (Forest Management Plan) or project approved, when applicable
- Field Audit

2.5.1 - Legal, customary and traditional tenure and use rights of indigenous people and local communities related to the forest are identified, documented and respected (CPET S9)

- Analysis of information from the area regarding use and abuse of fences and inadequate signs and closed gates
- Procedures for conduct field audits to verify these aspects if necessary.
- Disqualify material coming from areas where is confirmed the use and abuse of fences and inadequate signs and closed gates in a way that customary rights are not respected (except in case of licensed cattle parks or big game hunting areas).
- Promotion of Good Forest Practices
- Monitoring plan

Means of Verification:

- Checklist completed by the supplier/forest owner
- Legal license, when applicable
- Field Audit

2.8.1 - Appropriate safeguards are put in place to protect the health and safety of forest workers(CPET S12)

- Suppliers training and qualification.
- Confirmation of legal status of qualified suppliers in relation with health and safety requirements.
- Procedures for conduct monitoring field audits to verify all the aspects related with health and safety of forest workers.
- Disqualify material coming from areas where there are insufficient or inappropriate safeguards to protect the health and safety of forest workers.
- Promotion of Good Forest Practices
- Monitoring plan

Means of Verification:

- Documentation of the operator (supplier, owner or other): health insurance, medical certificates, Social security non-debt statement, training records, records of Personal Protection Equipment distribution, etc.
- Field Audit

2.9.1 - Biomass is not sourced from areas that had high carbon stocks in January 2008 and no longer have those high carbon stocks.

- Consultation of information sources regarding high carbon stocks areas (wetlands, peatlands and old mature forests stands).
- Analysis of information from the area regarding the riparian vegetation and old mature forests stands.
- Procedures for conduct monitoring field audits to verify if biomass is sourced from areas that had high carbon stocks in January 2008 and no longer have those high carbon stocks.

- Disqualify material coming from areas that had high carbon stocks in January 2008 and no longer have those high carbon stocks.
- Promotion of Good Forest Practices
- Monitoring plan

Means of Verification:

- Checklist completed by the supplier/forest owner
- Legal harvest license, when applicable
- Field Audit

9.2 Monitoring and outcomes

2019 results:

- 63 supplies with Information of Origin of Forest Material, totaling 22.171,2 tons of primary feedstock
- 27 Field Audits
- 53.941,46 tons of primary feedstock supplied with origin information from qualified suppliers
- 10.450,38 tons of primary feedstock with at least one indicator with specific risk
- 43.491,38 tons of primary feedstock with all indicators with low risk.

The indicators for which it was not possible to assess the risk as low were:

- 2.1.2 - Potential threats to forests and other areas with high conservation values (HCV) from forest management activities are identified and managed. (HCV 1, HVC 3, HCV4 e HCV5)
- 2.1.3 - Feedstock is not sourced from forests converted to production plantation forest or non-forest lands after January 2008.
- 2.2.1 - Feedstock is sourced from forests where there is appropriate assessment of impacts, and planning, implementation and monitoring to minimise them.
- 2.2.2 - Feedstock is sourced from forests where management maintains or improves soil quality (CPET S5b).
- 2.2.3 - Key ecosystems and habitats are conserved or set aside in their natural state (CPET S8b).
- 2.2.4 - Biodiversity is protected (CPET S5b).
- 2.4.1 - The health, vitality and other services provided by forest ecosystems are maintained or improved
- 2.9.1 - Biomass is not sourced from areas that had high carbon stocks in January 2008 and no longer have those high carbon stocks.

For the other indicators, it was possible to evaluate the risk as low, determined by:

- Information previously collected from the areas,
- Verification of areas during and/or after operations,
- The organizational level of the suppliers,
- The good condition of the machinery and equipment, and
- Training of workers and observation of good forestry practices during the execution of operations.

10 Detailed Findings for Indicators

Detailed findings for each Indicator are given in the document “SBP National Risk Assessment for Portugal” elaborated in compliance with SBP framework.

11 Review of Report

11.1 Peer Review

There was no review of the 2019 report, which was only updated with more recent information, maintaining the same supply base.

This report was originally sent to an independent reviewer. The review period was 10 days. The comments received were duly considered in the final edition of the report.

The reviewer is a Registered Professional Forester with university degrees in forestry from both Sweden and Canada. Since 1982, he has worked for various forest based companies and organisations in Sweden, Canada, Switzerland and Portugal where he currently resides.

At this time, he works in Portugal, Sweden, Norway, Denmark, USA and Canada as a natural resource consultant in management, representation and certification as well as an auditor for SBP, FSC, PEFC, ISO 9001, ISO 14001, ISO 19011, OHSAS 18001 and GAP analyses.

This version of the SBR has been revised in order to update the values of consumption and production, with no changes in the characteristics of the supply base to justify a new peer review.

11.2 Public or additional reviews

The Supply Base Evaluation, including the Risk Assessment and the Supplier Qualification and Control Program, was subject to a public consultation, launched on October 2, 2017, in order to gather contributions to consolidate or improve the Evaluation.

The consultation was done by e-mail, and more than 60 interested parties were contacted, including Authorities, Municipalities, Town Councils, Representative Entities, Teaching Institutions, Producer Associations, Companies, Service Providers, Clients, Specialists, Fire Department and Unions.

12 Approval of Report

Approval of Supply Base Report by senior management			
Report Prepared by:	Natércia Carvalho Giovanni de Alencastro	Gestor do Sistema Integrado Consultor	06/01/2020
	Name	Title	Date
The undersigned persons confirm that I/we are members of the organisation's senior management and do hereby affirm that the contents of this evaluation report were duly acknowledged by senior management as being accurate prior to approval and finalisation of the report.			
Report approved by:	João Baetas	Diretor Geral	06/01/2020
	Name	Title	Date

13 Updates

13.1 Significant changes in the Supply Base

The main changes in the Supply Base for 2019 are related with the following:

- Decrease on the percentage of forest residues consumption.
- Percentage increase in roundwood consumption.
- Decrease in the consumption of secondary feedstock, essentially chips, sawdust and wood offcuts of maritime pine.
- Maintenance of the Supply Base Evaluation, which enabled the increase more than a triple in the consumption of "SBP compliant" feedstock in relation to 2019.
- Increased input of FSC certified material (about 2 times the amount of 2019).

13.2 Effectiveness of previous mitigation measures

NA.

13.3 New risk ratings and mitigation measures

NA.

13.4 Actual figures for feedstock over the previous 12 months

The supply of last year (January to December 2018) is characterized as:

Material	Species	Quantity (t)
Roundwood	Maritime pine	14 749,16
	Umbrella pine	24 704,40
	Eucalyptus	17 278,08
	Other	1.216,16
Biomass (Forest residues)	Maritime and Umbrella Pine	52.236,12
Wood Industry Residues (Chips, Sawdust, Slabwood)	Maritime and Umbrella Pine	16 587,16
		126.768,08

13.5 Projected figures for feedstock over the next 12 months

The forecast supply for 2020 is characterized as:

Material	Species	Quantity (t)	%	
			SBP controlled	SBP compliant
Roundwood	Maritime and Umbrella Pine	40.000	15	45
	Otherspecies	18.000	5	5
Biomass (Forest residues)	Maritime and Umbrella Pine	52.000	5	10
Wood Industry Residues (Chips, Sawdust, Slabwood)	Maritime and Umbrella Pine	17.500	15	-
		127.500	100	