

Supply Base Report (SBR)

www.sustainablebiomasspartnership.org



Version 1.2 June 2016

NOTE:

This template, v1.2, is effective as of the date of publication, that is, 23 June 2016. Template v1.1 may still be used for those audits undertaken prior to 23 June 2016 and where the certificate is issued to Certificate Holders before 1 October 2016.

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

Document history

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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
 Telephone: +351 269 949 393, email: ncarvalho@glowood.pt
Company website: <http://www.glowood.pt>
Date report finalised: 05/01/2018
Close of last CB audit: 09/05/2017, 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: <http://www.sustainablebiomasspartnership.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"/>	X	<input type="checkbox"/>	<input type="checkbox"/>

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*).

All wood comes from forested áreas 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 35 small and medium companies 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 three sawmills, whose wood supply is also from adjacent forest areas in Portugal.

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

In 2017, Glowood produced a total of 51.889 t of pellets, with a level of consumption of raw material in the order of 109.000 t. These are average values for similar companies located in Portugal.

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

According to preliminary data from the latest National Forest Inventory, 2013 (IFN6 - Areas of land use and forest species in mainland Portugal in 1995, 2005 and 2010), the forest land use is the dominant use of the mainland. The Portuguese forest occupies 3.2 million hectares, which corresponds to 35.4% of the country, one of the largest proportions of forested areas of Europe.

Land-Uses in Portugal – 2010

Source: ICNF National Forest Inventory, Preliminary Results, 2013

- 35% Forestry
- 32% Bushland and Natural Pastures
- 24% Agriculture
- 5% Urban
- 2% Inland Waters
- 2% Unproductive

Forest Stands in Mainland Portugal – 2010

Source: ICNF National Forest Inventory, Preliminary Results, 2013

- 26% Eucalyptus/ Eucalyptus spp.
- 23% Corkoak / Quercus suber
- 23% Maritime Pine / Pinus pinaster
- 11% Holmoak / Quercus rotundifolia
- 6% Stone Pine / Pinus pinea
- 2% Oak / Quercus spp.
- 1% Sweet Chestnut Tree / Castanea sativa
- 6% Other Hardwoods
- 2% Other softwoods

The dominant forest species is Eucalyptus, representing the largest area of the country (812,000 ha; 26%), second is Cork Oak (737,000 ha; 23%), followed by the Maritime Pine (714,000 ha; 23%). The area occupied by softwood species corresponds to 31% of the Portuguese forest, the remainder (69%) is occupied by broadleaf species.

Over the period 1995-2010 the forest areas exhibited a decrease of 4.6%, corresponding to a net loss rate of 0.3% / year (10 mil ha / year). The net decrease of forest areas (-150,611 ha) is mainly due to conversion to the land use class "brush and pastures." In addition to this conversion, significant amount of forested land was converted to urban use between 1995 and 2010 (28 000 ha).

Note that although there is a decrease in forest area, the fact that this is not accentuated demonstrates the significant resilience of the forest to large disturbances to which it was subjected to during the review period. On the one hand, the very serious forest fires of the last two decades (more than 2.5 million hectares burned between 1990 and 2012), and on the other, the occurrence of diseases such as the pine wood nematode which has severely affected the maritime pine nationally, forcing excessive harvests due to enforcing of phytosanitary regulations. No other country in Europe has been subject to this level of disturbance.

The decrease of forest area is mainly due to reduction in temporarily treeless areas (burned areas, harvested areas and regenerated areas), with emphasis on increasing the areas reforested, which is explained in part by the action of nature itself (natural regeneration) demonstrating the natural adaptation of the soil to the forest, but also by the action of forest owners who have continued to invest in reforestation.

According to preliminary data from IFN6, the main change of forest species between 1995 and 2010, were maritime pine presenting a decrease of about 263 000 ha (26.9% less). Most of this area became "brush and pastures" (165,000 ha), 70,000 ha to eucalyptus, 13 000 ha in urban areas and 13,700 ha in forest areas with other tree species.

On the other hand, there is an increase of eucalyptus area of about 95,000 hectares. It is also to highlight the increase of umbrella pine (46% in total area and 54% in terms of replanted area).

The change in area of other species has been less significant, especially during the period 2005 to 2010.

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 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 AIFP 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 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 intertree 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 PRODER, together with the development of forest certification processes.

In April 2013 (last available information ICNF), there were 2,266 approved FMPs (1,522,195 hectares), representing 44% of the forest area in 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) lists the following species in Portugal and Spain, not including timber species:

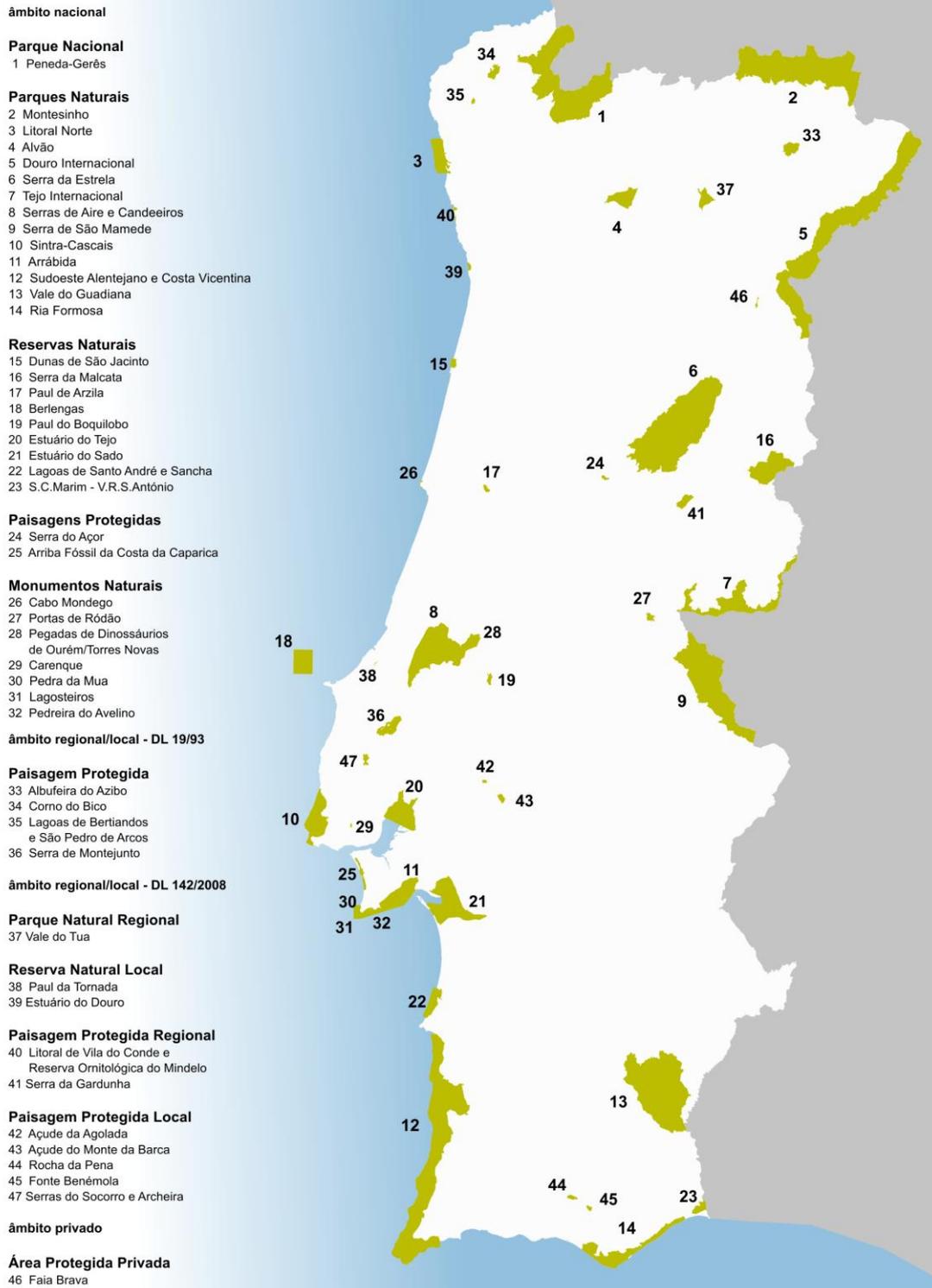
Portugal:

<i>Antipatheserinaceus</i>	<i>Stichopathes dissimilis</i>	<i>Stichopathes richardi</i>
<i>Stichopathes robusta</i>	<i>Stichopathes setacea</i>	<i>Leiopathes expansa</i>
<i>Tanacetipathes cavernicola</i>	<i>Tanacetipathes squamosa</i>	<i>Tanacetipathes wirtzi</i>
<i>Paracyathus arcuatus</i>	<i>Leptopsammia formosa</i>	<i>Madracis profunda</i>
<i>Crypthelia medioatlantica</i>	<i>Crypthelia vascomarquesi</i>	<i>Errina atlantica</i>
<i>Errina dabneyi</i>	<i>Lepidopora eburnea</i>	<i>Euphorbia despoliata</i>
<i>Euphorbia longifolia</i>	<i>Euphorbia pedroi</i>	<i>Euphorbia piscatoria</i>
<i>Euphorbia stygiana</i>	<i>Dactylorhiza foliosa</i>	<i>Goodyera macrophylla</i>
<i>Orchis scopulorum</i>	<i>Platanthera micrantha</i>	

In the "Red List" of the IUCN (International Union for Conservation of Nature and Natural Resources), posted 891 species for the continental territories of Spain and Portugal (Iberia), of which 76 have forestry activity as one of the threats:

<i>Ammoidespusilla</i>	<i>Anarrhinum longipedicellatum</i>	<i>Andrena curtula</i>
<i>Andrena fulva</i>	<i>Andrena gredana</i>	<i>Antirrhinum lopesianum</i>
<i>Arabis sadina</i>	<i>Aristolochia paucinervis</i>	<i>Armeria rouyana</i>
<i>Arnica montana</i>	<i>Asphodelus bento-rainhae</i>	<i>Bunium bulbocastanum</i>
<i>Calopteryx virgo</i>	<i>Candidula belemensis</i>	<i>Centaurea fraylensis</i>
<i>Clytus tropicus</i>	<i>Culcita macrocarpa</i>	<i>Dactylorhiza elata</i>
<i>Dianthus marizii</i>	<i>Elona quimperiana</i>	<i>Eryngium viviparum</i>
<i>Euphorbia transtagana</i>	<i>Festuca brigantina</i>	<i>Festuca summilusitana</i>
<i>Flavipanurgus granadensis</i>	<i>Flavipanurgus ibericus</i>	<i>Flavipanurgus venustus</i>
<i>Helicigona lapicida</i>	<i>Juncus valvatus</i>	<i>Leiostyla anglica</i>
<i>Lucanus barbarossa</i>	<i>Lynx pardinus</i>	<i>Malus sylvestris</i>
<i>Narcissus asturiensis</i>	<i>Narcissus cyclamineus</i>	<i>Narcissus triandrus</i>
<i>Neottia nidus-avis</i>	<i>Nomada similis</i>	<i>Oestophora lusitanica</i>
<i>Ononis maweana</i>	<i>Paeonia officinalis</i>	<i>Picris willkommii</i>
<i>Reitterelater bouyoni</i>	<i>Silene longicilia</i>	<i>Spermodea lamellata</i>
<i>Stenagostus laufferi</i>	<i>Thorella verticillato-inundata</i>	<i>Thymus capitellatus</i>
<i>Veronica micrantha</i>		

Map of the infrastructure of National Protected Areas:



Product Group	Certification	Nº Suppliers	Input Group	Format	Species	Quantity (t)	%
Controlled Feedstock	FSC CW (*)	32	Primary feedstock from forests (products or residues)	Roundwood	Maritime pine Umbrella pine Poplar and Acacia	34.300,68	31,76
			Primary feedstock from forests (products or residues)	Roundwood	Eucayptus	2.837,28	2,63
			Primary feedstock from forests (products or residues)	Wood chips	Maritime pine Umbrella pine	38.150,02	35,33
			Wood industry residues (secondary feedstock)	Wood chips Sawdust Wood offcuts	Maritime pine	27.822,40	25,76
			Primary feedstock from forests (products or residues)	Chips	Maritime pine Umbrella pine	3.336,96	3,09
SBP-compliant Primary Feedstock	FSC	1	FSC 100%	Roundwood	Eucayptus	1.230,96	1,14
SBP-compliant Secondary Feedstock	FSC, PEFC	1	FSC Mix	Wood chips Sawdust	Maritime pine	315.02	0,29

(*) 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 2017, it is estimated that 6,91% of wood material consumed may have originated in final fellings, being 2,4% 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: 3,2 million ha
- b. Tenure by type: Private: 2,8 million ha Public: 442400 ha
- c. Forest by type: Temperate: 3,2 million ha
- d. Forest by management type: Plantations: 1.8 million ha; Natural/ Semi natural: 1.4 million ha
- e. Certified forest by scheme (ha): FSC: 384.588 ha PEFC: 256.369 ha

Feedstock

- f. Total volume of feedstock: 0 – 200.000 t (108.075 t)
- g. Volume of primary feedstock: 0 – 200.000 t (79.963 t)
- h. Percentage of primary feedstock:
 - Certified to an SBP-approved Forest Management Scheme: 1,14 % (1.230,96 t)
 - Not certified to an SBP-approved Forest Management Scheme: 98,86 %

- 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*)

- j. No feedstock from primary forest.
- k. Primary feedstock from primary forest certified to an SBP-approved Forest Management Scheme – 1,14%
Primary feedstock from primary forest not certified to an SBP-approved Forest Management Scheme – 98,86 %
- l. Volume of secondary feedstock: 28.112 tonnes (27,37%)
- m. No tertiary feedstock

For the following year, we intend to maintain the supply profile from 2017, maintaining or increasing the consumption of primary feedstock and slightly reducing the consumption of secondary feedstock, essentially woodchips, sawdust and slabwood from maritime pine.

With the company's continued efforts to encourage the supply of certified source material (FSC or PEFC), it is expected that there may be volumes registered for these material categories.

It is also intended to maintain a Supply Base Evaluation (SBE) and, after certification of SBP Standard 1: Feedstock Compliance Standard, start and progressively expand the SBP compliant feedstock.

3 Requirement for a Supply Base Evaluation

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

Virtually all consumed 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**.

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 the domestic 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 ANPEB (National Association of Biomass Energy Pellets), is not yet completed and endorsed by SBP, the Regional Risk Assessment produced by NEPCon at the request by ANPEB was considered for this SBE, in accordance with the requirements of the SBP, for primary feedstock originating from the mainland of Portugal, having identified 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 11 suppliers
- 8 qualified suppliers
- 13 Monitoring Audits (Primary Feedstock)
- 25 supplies with Information of Origin of the Forest Material, totaling 22.171,2 tons of primary feedstock

The main indicator for which it was not possible to assess the risk as low was 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, HCV 4 and HCV 5)).

Essentially, these were 5 supplies from protected areas without approval from the authorities, and/or, for operations not planned in the scope of a Forest Management Plan approved by the authority.

There was 1 supply in which the indicator 2.1.3 (Feedstock is not sourced from forests converted to production plantation forest or non-forest lands after January 2008.) was not evaluated as low risk because it was a clear-cut of an area that will be converted into pasture.

In addition, there was 1 supply where indicator 2.8.1 (appropriate safeguards are put in place to protect the health and safety of forest workers.) was also not assessed as low risk due to the conditions of some subcontracted workers, causing the supplier to not yet obtain the qualification.

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, the National Risk Assessment by NEPCo at the request of ANPEB was considered, in accordance with the requirements of the SBP, taking into account the reputation that entity has in the fields of SBP and the FSC, specifically on the risk assessments in that such initiatives are required for the production of certified material.

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

The suppliers of primary feedstock for the company were evaluated for their capacity and regularity of supply, initially identifying 14 with the potential for the implementation of the Supplier Qualification and Control Program, with the prospect of obtaining 70% of primary material for the production of pellets with SBP compliant biomass in a first phase.

The identified suppliers were invited to participate in the Program, with 11 suppliers being trained, of which 8 were eventually qualified and formally agreed to participate.

As support, Good Practice Guidelines were prepared and distributed, applicable to suppliers and property owners and managers, as well as forms for collecting and sending information.

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.

Based on the information from the area previously provided, the company's managers evaluate the framework and identify any aspects to be verified and confirmed, whether through documentation, site audit, or stakeholder consultation.

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 by NEPCon at the 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

Indicator	Mitigating measures	Means of Verification
2.1.1 2.1.2 2.2.3 2.2.4	<ul style="list-style-type: none"> • Approval and qualification of the suppliers • Promoting good practices • Disallow feedstock from areas where there are proven threats to biodiversity. • Monitoring 	<ul style="list-style-type: none"> • Checklist completed by supplier/property owner • Consultation of the information, cartography and conditions established for the areas • Inspection
2.1.3	<ul style="list-style-type: none"> • Disallow feedstock from natural forests planted with eucalyptus after 2008, or to be planted with eucalyptus, or converted to pasture, agriculture or other use. • Monitoring 	<ul style="list-style-type: none"> • Checklist completed by supplier/property owner
2.2.2	<ul style="list-style-type: none"> • Disallow feedstock from areas susceptible to desertification with proven soil damages, and areas above the minimum size required to have a PGF as established in the respective PROF. • Monitoring 	<ul style="list-style-type: none"> • Consultation of the cartography of ICNF and the respective PROF • Inspection
2.2.1 2.2.6	<ul style="list-style-type: none"> • Disallow feedstock from clear-cut areas above the maximum limit. • Qualification of the suppliers • Promoting good practices • Monitoring 	<ul style="list-style-type: none"> • Checklist completed by supplier/property owner • Consultation of the respective PROF • Inspection
2.4.1 2.4.2	<ul style="list-style-type: none"> • Approval and qualification of the suppliers • Promoting good practices • Disallow feedstock from areas with proven threats to the health and vitality of the forest • Monitoring 	<ul style="list-style-type: none"> • Checklist completed by supplier/property owner • Inspection
2.5.1	<ul style="list-style-type: none"> • Disallow feedstock from areas with abusive use of the fences. • Monitoring 	<ul style="list-style-type: none"> • Checklist completed by supplier/property owner • Inspection
2.8.1	<ul style="list-style-type: none"> • Approval and qualification of the suppliers • Promoting good practices • Disallow feedstock where failure to comply with health, safety and workers' rights have been proven • Monitoring 	<ul style="list-style-type: none"> • Checklist completed by supplier/property owner • Documentation from the supplier/property owner (Insurance, Aptitude forms, Declarations from Social Security, Training records, Records of PPE distribution, etc.) • Inspection
2.9.1	<ul style="list-style-type: none"> • Approval and qualification of the suppliers • Promoting good practices • Disallow feedstock from riparian areas and harvest or conversion of mature oak after 2008. • Monitoring 	<ul style="list-style-type: none"> • Checklist completed by supplier/property owner • Cutting license • Inspection

9.2 Monitoring and outcomes

To date, 13 Monitoring Audits (Primary Feedstock) have been carried out, resulting in:

- 25 supplies with Information of Origin of Forest Material, totaling 22.171,2 tons of primary feedstock;
- 2.532,04 tons of primary feedstock with at least one indicator with specific risk.
- 19.639,16 tons of primary feedstock with all indicators with low risk.

The main indicator for which it was not possible to assess the risk as low was 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, HCV 4 and HCV 5)).

Essentially, these were 5 supplies from protected areas without approval from the authorities, and/or, for operations not planned in the scope of a Forest Management Plan approved by the authority.

In addition, there was one supply where indicator 2.8.1 (appropriate safeguards are put in place to protect the health and safety of forest workers.) was also not assessed as low risk due to the conditions of some subcontracted workers, causing the supplier to not yet obtain the qualification. 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 Indicators are presented in the document "National SBP Risks Assessment for Portugal" prepared by NEPCON at the request of ANPEB, in accordance with the requirements of the SBP.

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

11 Review of Report

11.1 Peer Review

This report was 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.

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	05/01/2018
	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	05/01/2018
	Name	Title	Date

13 Updates

13.1 Significant changes in the Supply Base

The main changes in the Supply Base for 2017 relate to the following:

- Significant decrease in the consumption of primary feedstock, mainly round wood.
- Increased consumption of Residual Forest Biomass
- Increase in the consumption of secondary feedstock, essentially chips, sawdust and slabwood of maritime pine.
- Implementation of the Supply Base Evaluation to enable the consumption of SBP compliant feedstock originating from areas in which all the SBP indicators are evaluated as low risk.
- Entry of FSC and PEFC certified material

The combination of these changes translates into a significant improvement in the supply profile in view of the sustainability of forestry production and, consequently, the production of pellets for energy purposes.

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 2017) is characterized as:

Material	Species	Quantity (t)
Roundwood	Maritime pine	16.153
	Umbrella pine	16.081
	Eucalyptus	4.068
	Other	2.067
Biomass (Forest residues)	Maritime and Umbrella Pine	40.119
	Eucalyptus	482
	Other	886
Wood Industry Residues (Chips, Sawdust, Slabwood)	Maritime and Umbrella Pine	28.219
		108.075

13.5 Projected figures for feedstock over the next 12 months

The forecast supply for 2018 is characterized as:

Material	Species	Quantity (t)	%	
			SBP controlled	SBP compliant
Roundwood	Maritime and Umbrella Pine	93.089	15	45
	Otherspecies	15.515	5	5
Biomass (Forest residues)	Maritime and Umbrella Pine	23.272	5	10
Wood Industry Residues (Chips, Sawdust, Slabwood)	Maritime and Umbrella Pine	23.272	15	-
		155.148	100	