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| ***INSPECTION OF SAWMILL INDUSTRY*** |

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# Introduction

European governmental policy – also due to international agreements such as the Kyoto Protocol – has set up renewable energy target of 20% by 2020 and stimulate biomass use in the power, heat and transport sectors. According to the European Directives, European Governments encourage as well green power by granting support mechanisms under the form of green certificates or feed-in tariffs. This results in growing global demand for bio-energy resources originating from agriculture and forestry. But to effectively protect the environment a verification programme with a quality mark is necessary in order to guarantee that fossil fuels are substituted in a sustainable fashion by biomass.

Therefore, on behalf of Electrabel, Laborelec and SGS have put in place a verification procedure applied to each wood pellets production unit. This procedure requires at least:

* the evaluation of the **overall energy balance** for the supply of each biomass feedstock including needed fossil energy for making the biomass suitable (drying, pelletising, …) and transporting it up to the power plant: please note that in the case of by-products (i.e. residues), the evaluation of supply chain energy use starts only from the point where the by-products is created;
* the **full traceability of the resources** that were used for manufacturing the biomass and the evidence that those resources are **managed in a sustained way**.

The verification procedure relies on some key players. Saw mills are part of those players as far as woody biomass generation is concerned. Wood pellets manufacture is indeed often based upon residues originating from saw mills, and their activities play as well a role in the energetic balance of the whole supply chain as well as possible environmental, economical and social impacts.

This document is the procedure prepared for auditors to achieve independent audits on biomass processing site, with respect to sustainability principles.

# Administrative information

*Involved parties are here identified and data is collected to ensure traceability and level of competence*. *It also enables biomass identification sourcing.*

**Basic information on the inspection:**

|  |  |
| --- | --- |
| **Name of the certification company** |  |
| **Date of audit (on site)** |  |
| **Certification(please indicate)** | * + ISO 17 011   + ISO 19011 (Guidelines adopted)   + EMAS   + National accreditation   + Other… |

*The table below gives information on the inspector(s)’ expertise level.*

|  |  |
| --- | --- |
| **Name of the inspector** |  |
| **Training and professional background (description of relevant audits experiences)** |  |

**General Information on the biomass factory (saw mill):**

Company :…………………………………………………………………………....………

Name of contact person : …………………...…………………………………………..……

Address :………………………………...…………………………………………………...

City :………………………………………………………Postcode :……………………....

Country : ………………………Tel :..……………………Fax :….……………..………….

e-mail address : ………………………………………………………………………..…….

# Please indicate site of production if different from company location

Name of contact person : …………………...…………………………………………..……

Address :………………………………...…………………………………………………...

City :………………………………………………………Postcode :……………………....

Country : ………………………Tel :..……………………Fax :….……………..………….

e-mail address : ………………………………………………………………………..…….

**Operation License certification**

|  |  |
| --- | --- |
| Operation License certification | |
| Type and reference number | ……………………………………………………………….  ………………………………………………………………. |
| Place and date of issue | …………………………….……………… , DD/MM/YYYY |
| Emitted by | ……………………………………………………………….  ………………………………………………………………. |

**Certification (if applicable)**

|  |  |
| --- | --- |
| Certification label of the Company (If different documents exists please fill in different boxes) | |
| Type and reference number  (ISO 9001:2000, ISO 14001:2004, SA 8000:2001, Other…) | ……………………………………………………………….  ………………………………………………………………. |
| Place and date of issue | …………………………….……………… , DD/MM/YYYY |
| Emitted by | ……………………………………………………………….  ………………………………………………………………. |

# Scope of the sustainability assessment of wood pellets

This form involves the intermediary processing part of the wood pellets production.

## Description of the wood production chain



The scope perimeter of this inspection is limited to the transport of input material to output production. All activities within the sawmil will be under the scope of the audit. Materials quantities to be assessed are restricted to the inputs and outputs materials which are to be used in pellets plants.



|  |  |
| --- | --- |
| **Production stage** | **Description** |
| Raw material, primary product (possibly forests) | 1. Collection of the raw material (e.g. forest cultivation and exploitation) 2. Transport of the raw material (e.g. wood) to the processing industry to the biomass preparation unit (e.g. sawmill). 3. Alternatively, production of the primary product (e.g. sawlogs) via dedicated process. |
| Processing at saw mill’s level: what kind of process is carried out ? | 1. Does drying process occur at saw mill level ? for wood pellets, the sawdust is dried until moisture content of 8 to 10% is reached. The drying is potentially performed by means of a dryer that uses biomass, gas or fossil fuel as energy. 2. Sieving and milling of the wood pieces |

## Wood processing scheme (transport, maintenance, processing and storage).

*In this part, the inspector must describe the wood manufacturing scheme. This must include equipments used and (if applicable) storage infrastructure. If transport occurs, the vehicles used must also be described.*

## Biomass sourcing: type and origin of raw material used in the saw mill

|  |  |  |
| --- | --- | --- |
| TYPE OF RAW MATERIAL USED  Fill in according to the origin of all the woody raw materials used in the final product (expressed in Mass % of the final product).  Several options can be selected. | \_\_\_\_%  \_\_\_\_%  \_\_\_\_%  \_\_\_\_%  \_\_\_\_%  \_\_\_\_%  \_\_\_\_% | 🞎 Sanitary cuttings of forests  🞎 hard wood  🞎 soft wood  🞎 Treated wood (with traces of paint, varnish, preservatives, MDF, wood boards, etc.)  🞎 Timber wood  🞎 Short rotation coppices (cycle between 4 & 8 years)  🞎 Others, specify ………………………………… |

*In an joined Excel Sheet the auditors should report on the following elements, to ensure biomass identification. This document should be designed as shown in Appendix B.*

## Outputs of the saw mill (inputs for the pellets plant): type and processes.

|  |  |  |
| --- | --- | --- |
| Fill in according to the type of woody products that are to be transferred to the pellets plant  (expressed in Mass %).  Several options can be selected. | \_\_\_\_%  \_\_\_\_%  \_\_\_\_%  \_\_\_\_%  \_\_\_\_%  \_\_\_\_%  \_\_\_\_% | 🞎 Saw dust  🞎 Shavings  🞎 Treated wood (with traces of paint, varnish, preservatives, MDF, wood boards, etc.)  🞎 Rotten wood  🞎 Others, specify ………………………………  Average percentage of bark in mass: ………% |

# CERTIFICATION LIST BASED ON CRAMER PRINCIPLES

This audit form is based on the Sustainability principles developed by the Cramer Commission. It is designed to assist inspectors in the implementation of the verification criteria set by the NTA commission (last version published in February 2009).

Only the criteria that are relevant for the type of activities of the audited body have been selected and listed.

For a practical approach of these criteria, the NTA document was adapted with elements retrieved from the QUALIFOR generic documents and special energy balance procedure developed by Laborelec.The structure of the document is as follows for the principles 2 t o10:

First principle on Carbon balance is mainly assessed following the experienced procedure of Laborelec-SGS.

For the other principles, the assessment will be based on the QUALIFOR and NTA inputs.

As it is required to assess the respect of all relevant local legislation (environmental: biodiversity, soil-water and air quality; social and economic), Appendix A provides guidelines for this legislation assessment. The inspector should verify that the needed documentation is made available and is part of a well-organized and updated documentation procedure. History of documentation should comply with regulatory requirements.

Stakeholder consultation is required, as part of the audit, if no documented operation license is provided (Guidance following ISO 19 011).

## GHG and energy balance

### Overall energy consumption within the sawmill activities

*The auditor must verify all data and comment on the following issues.*

* *Energy resources that are used on the raw material production site. If no energy consumption is needed, it must be justified.*
* *As there might be some intermediary operations, any energy use for these must also be recorded.*
* *Energy consumption may be calculated trough different methods, which must be described.*

|  |  |
| --- | --- |
| **Parameter** | **Description** |
| Comment on the energy resources that are used within the biomass factory (e.g. for maintenance, harvesting, transport):  Example :  electricity mix characterization, biomass, gasoil, gas,..  If no energy consumption is needed, then please justify |  |

|  |  |
| --- | --- |
| **Use of fuel (in transport of the input material, in wood processing):** | *Delete this part if not applicable.*  *Please make separate tables for transport and processing. Separate also the inventory of different types of fuel.* |
| Fuel consumption (in MJ fuel per metric ton of biomass produced): |  |
| Explain how this energy consumption has been evaluated : | 🞎 invoices of fuel suppliers, on the following period: ……………………………..  🞎 fuel consumption (\_\_\_\_\_ton/h) and efficiency of installed cogeneration plant (\_\_\_\_%)  🞎 a theoretical evaluation based upon specific consumptions of installed machinery  🞎 other explanation: .................................................................... |
| Give the full calculation that lead to the energy consumption (expressed in kWh per metric ton of biomass produced). | *In annex: Excel sheet* |

|  |  |
| --- | --- |
| Electricity (if applicable): | *Delete this part if not applicable.* |
| Electricity consumption (in kWh per metric ton of biomass produced): |  |
| Explain how this specific electricity consumption has been evaluated | 🞎 a theoretical evaluation based upon specific consumptions of installed machinery and nominal production capacity of the plant,  🞎 invoices of external electricity supplier and statistics of biomass production, on the following period: …………………………………………  🞎 specific fuel consumption and electrical efficiency of installed cogeneration plant and biomass production plant  🞎 Other explanation: ................................................................... |
| Give the full calculation that lead to the above mentioned energy consumption | *In annex: Excel sheet* |
| Specify where the electricity comes from:  (If it comes from a cogeneration, the auditor has to add the fuel consumption of the installation) | ❑ from the electric network (characterization of the mix)  ❑ cogeneration  ❑ wind turbines  ❑ other source:………………………………………  ……………………………………………………….  ……………………………………………………….. |

### Description and performance of the dryer process (if applicable):

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Explanation/unit asked** | **Comments from the auditor:** |
| Type of dryer(s) used | Supplier + other information + picture | If no drying is needed, please justify |
| Dryer’s performance | In tons/hour |  |
| Average moisture content of the raw material (before the drying process) | Expressed in %, on dry base:  (i.e. 100% = 1 kg water/kg dry matter) | 🞎 low=20%  🞎 normal dry=30%  🞎 high (fresh wood)=100% |
| Explain the storage conditions that explains such a moisture content: |  |  |
| Humidity after the drying process (target): | Expressed in %, on dry base: |  |
| Type of energy resource used in dryer | ❑ wood dust (dust<1mm)  ❑ wood pellets  ❑ other biomass  ❑ natural gas  ❑ electricity  ❑ other |  |

**The energy consumption of the drying process will be evaluated on basis of the following theoretical analyses.**

This evaluation is based upon

* the averaged moisture content of the raw material that must be estimated:  
  low=20%, normal dry=30%, high (fresh wood)=100%, expressed on dry base   
  (i.e. 100%= 1 kg water/kg dry matter)
* and the target moisture for the final product   
  (i.e. 10% for pellets, see row *requested drying*, column *reference*):

Calculation of enthalpy for water evaporation is then made in the next table.

The necessary primary energy results from this enthalpy multiplied by the efficiency of the drying process i.e. (see row *primary energy*, column *reference* in the table)

* 93% if the energy carrier is hot air;
* 90% if the energy carrier is hot water;
* 85% if the energy carrier is water steam or another carrier (as in the table)

The equivalent loss of green power per ton of biomass is then estimated with respect to a reference combined cycle power plant (CCPP) with an electric efficiency of 55%:

**Table :**

**Excel sheet calculating energy used for drying according to moisture content of raw material.**

****

## Environmental Impacts Assessment (EIA).

|  |  |  |
| --- | --- | --- |
| Assessment of environmental impacts shall be completed - appropriate to the scale of processing operations- and adequately integrated into management systems. | | Competence |
| Waste disposal procedure (reduction, recycling, re-use and disposal of in an environmentally and socially responsible manner).  If chemicals are used, proper equipment and training shall be provided to minimise health and environmental risks.  *(There is an up-to-date list of all chemicals used in the organisation that documents trade name, and active ingredient. Where not provided by the product label, authorised applications, application methods and rates will also be documented)* | *Manager’s knowledge of the site and impacts of operations*  *Field observations*  *Management plan*  *Documented environmental statement or assessment where legally required*  *Interviews with Company Managers, supervisors and workers also testing their knowledge of minimum requirements*  *Chemicals include any surfactants, dispersants or solvents used.*  Records of chemicals in use.  Receipts and invoices.  Procedures for the safe and appropriate use of chemicals  Evidence that waste has been disposed off in an acceptable manner. | Assessment |

## Soil quality management

|  |  |  |
| --- | --- | --- |
| In the production and processing of biomass, the soil, and soil quality must be retained | | Competence |
| There are w*ritten guidelines defining acceptable practice are available to workers* for the use and storage of chemicals, transport fuels, lubrication oil, etc  *Operational guidelines must meet or exceed national or regional best practice requirements. There must be continuous verification and update.* | Documented site information and field observations on soil degradation through erosion, oil and chemical spills, etc.  Evidence that site information is being used in planning of operations.  Maps showing new roads and locations of new and ongoing operations  Interviews with Managers, staff and local experts. | Assessment |

## Ground and surface water management.

|  |  |  |
| --- | --- | --- |
| In the production and processing of biomass, ground and surface water, must not be depleted and the water quality must be maintained | | Competence |
| Major water resources within the processing area are identified. Sensitive or less renewable water sources are not used.  Water is efficiently used in the process.  Buffer zones are maintained along watercourses and around water bodies. These buffer zones are demarcated on maps and comply with specifications made in national and regional best practice guidelines.  *There must be continuous verification and update of these guidelines.* | Maps and interviews with Managers and staff.  Operational plans and field observations (water intakes, efficiency of water use, recycling of water, wastewater treatment). | Assessment |

## Air quality management

|  |  |  |
| --- | --- | --- |
| In the production and processing of biomass, the air quality must be maintained | | Competence |
| Noxious process emissions are avoided by applying guidelines to comply with specifications made in national and regional best practice guidelines.  *There must be continuous verification and update of these guidelines.*  There must be annual measurement of dust and pollutants emissions.  Use of fire for waste disposal is avoided except in specific situation and then fully justified. | Operational plans  Interviews with Managers, staff and records of training.  Fire readiness and control procedures. | Assessment |

## Contribution to local prosperity related to wood processing

|  |  |  |
| --- | --- | --- |
| The production of biomass must contribute towards local prosperity | | Competence |
| The management plan must define and describe the measures taken for local employment and contribution to the local economy.  - | Evidence of opportunities to support local processing and markets (management plan or interviews).  *More detailed indicators can be found in EC1, EC6 and EC7 of the GRI reporting.* | Assessment |

## Contribution of the company management to local welfare

|  |  |  |
| --- | --- | --- |
| Company management should meet or exceed all applicable laws and/or regulations covering health and safety of employees and their families | | Competence |
| Biomass factory Managers are aware of laws and/or regulations covering health and safety of employees and their families and comply with, such as:   * Universal Declaration of Human Rights of the United Nations. * Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy (ILO).   For large scale organisations a written safety and health policy and management system are in place | Interviews with Managers, workers and union representatives.  Guidelines/regulations are readily available.  Labour directives and inspection reports.  Review of policies, procedures and personnel records. | Assessment |
| Clear exploitation rights to the land (e.g. land title, customary rights or lease agreements) shall be demonstrated | |  |
| There is documentation showing the owner/manager’s legal rights to occupy the land. | Documentation with appropriate legal status. |  |
| The company should give opportunities for employment, training, and other services | | Competence |
| People in local communities are given opportunities in employment, training and contracting.  People in local communities are well informed on the activities of the company and their impacts on their environment. | Interviews with Managers and workers.  Consultation with representatives of local communities and labour unions.  Training strategies.  Job advertisements in local publications | Assessment |

Appendix A

Regulations and standards applicable in

|  |  |
| --- | --- |
| **A.** | **National Legislation** |
|  | **Environment:** |
|  |  |
|  |  |
|  | **Cultural and social:** |
|  |  |
|  |  |
| **B.** | **Regulations pertinent to WOOD INDUStry related to and emerging from National Legislation and other legislative institutions:** |
|  |  |
|  |  |
| **C.** | **International Agreements pertinent to WOOD INDUStry** |
|  | International Labour Organisation (ILO) |
|  |  |
|  |  |
|  |  |
| **D.** | **Local Standards and Best Operating Practices** |
|  |  |
|  |  |

Appendix B - biomass identification

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Per country of origin, per supplier and per generic type of materials** | | | | | | | |
| List all main raw biomass resources constituents of the final biomass product | Mention the related countries/regions of origin of the raw biomass resources (one per line) | For each raw biomass resource (each line), mention the related suppliers’ coordinates of the raw biomass resources | If raw material is produced from certified forest mention: Name of certification scheme\* and related data | | Give the ratio in the total  in % | Mention  Average distance from the biomass production plant in km | Mention  Maximal distance from the biomass production plant in km |
| Validity period | Reference number |
| 1) |  |  |  |  |  |  |  |
| 2) |  |  |  |  |  |  |  |
| 3) |  |  |  |  |  |  |  |
| 4) |  |  |  |  |  |  |  |

\* Relevant forestry certification schemes are:

🞎 FSC (Forest Stewardship Council)

🞎 PEFC (Pan European Forest Certification): national or regional

🞎 CSA-SFM (Canadian Standards Association’s Sustainable Forest Management)

🞎 SFI (Sustainable Forest Initiative)

🞎 FFCS (Finnish Forest Certification System)