# − Pellet supplier audit procedure −

## Supplier identification: ......-...

## Inspection year :

## Customer name :

## Project number :

## The general information above is to be filled in by SGS Belgium.

## Scope

The European Union policy – in accordance with international agreements such as the Kyoto Protocol – has set up renewable energy target of 20% by 2020 and stimulates biomass use in the power, heat and transport sectors. According to the European Renewable Energy 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 program 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 biomass production unit. This procedure requires at least:

* the evaluation of the **energy consumptions** along the pellet supply chain (milling, drying, pelletizing, transportation…). If the raw material is a residue (e.g. sawdust), the evaluation energy use within the supply chain starts only from the point where the residue is generated (e.g. sawmill);
* the **full traceability of the resources** that were used for manufacturing the biomass and the evidence that those resources are **managed in a sustainable way**.

This document describes the procedure prepared for auditors to achieve independent audits on biomass processing site, with respect to sustainability principles. Once this audit document has been filled in by the auditor (adding useful comments, calculations, pictures and other audit findings) it will then constitute the final inspection report that is divided in 6 parts:

* **PART 1 – Administrative information**
* **PART 2 – Raw biomass sourcing and certification**
* **PART 3 – Pellet production chain**
* **PART 4 – Energy balance**
* **PART 5 – Transportation of the delivered pellets**
* **PART 6 – Contact details and audit report signature**

SGS requires the auditors to visit the site of the biomass production plant **once a year**, to collect the requested information and to prepare a clear and illustrated report according to the instructions/checklists in the present document. All parameters mentioned in this document must be carefully checked by the auditor and explained in this report. The pellet plant operator must fill in the “**Pellet Supplier Declaration Form**” (see document 02) that the auditor must attach to the audit report as a separate document.

## PART 1 – Administrative information

**Basic information on the audit and the inspection company**

|  |  |
| --- | --- |
| **Date of audit (on site)** |  |
| **Name of the verification company** |  |
| **Domain of activity** |  |
| **Accreditation type****for the main domain of activity (if any)** | * + ISO 17 021
	+ ISO guide 65
	+ EMAS
	+ National accreditation body: ……………………………………
	+ Other, specify ……………………………………………………
 |

**General Information on the pellet factory**

|  |  |
| --- | --- |
| **Name of the production unit** |  |
| **Company name** |  |
| **Contact person on site** |  |
| **Function**  |  |
| **e-mail** |  |
| **Address factory** (physical location of the production unit) |  |
| **Telephone factory****Fax factory** |  |
| **Describe the location and the surroundings of the production unit:** *(e.g. in an industrial estate, in forest area, next to a sawmill, next to a harbour...)* |  |
| **Geographic coordinates :***(to be provided if the production unit is situated outside the European Union)* | ……………………latitude…………………….longitude |

***Please indicate company office if different from the factory location***

|  |  |
| --- | --- |
| **Address company office** *(if different from the production unit)* |  |
| **Telephone / Fax company office***(if different from the production unit)* |  |

***Insert the location of the pellet factory on a regional map:***

**Operating license of the pellet company**

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

**Certification of the pellet company (if applicable)**

|  |
| --- |
| Certification label of the Company (*if several certifications are applicable, please use several copies of this table*) |
| Type and reference number(ISO 9001:2000, ISO 14001:2004, SA 8000:2001, Other…) | ……………………………………………………………….………………………………………………………………. |
| Place and date of issue | …………………………….……………… , DD/MM/YYYY  |
| Emitted by | ……………………………………………………………….………………………………………………………………. |

## PART 2 – Raw biomass sourcing and certification

**Introduction**

This part has been designed for essentially **woody biomass** as far as certification is concerned.

Nevertheless, please mention any other type of biomass that is used as raw material if applicable.

On the next pages, it is necessary to list all main sources of raw material suppliers per country / region of origin and per generic type of materials.

A different table has to be to be filled in for each type of generic raw material and for each country/region of origin. **Use as many copies of the table as needed** to describe each kind of raw material and each country/region of origin.

If several suppliers are similar (i.e. they deliver the same kind of raw product from the same country / region of origin), it is permitted to regroup them in the same table. All suppliers involved have to be listed in each table or in annex.

In each table, one must mention any applicable forest certification system for the raw woody material. Possible forest certification systems are:

• FSC (Forest Stewardship Council) <http://www.fsc.org/en/>

• PEFC (Pan European Forest Certification), <http://www.pefc.org/internet/html/>

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

• SFI (Sustainable Forest Initiative)

• FFCS (Finnish Forest Certification System)

• APSC Approved pre-scope certificate of one of the endorsed forest management certification systems, with the intention of full certification

**Description of the various categories of raw materials**

|  |
| --- |
| RAW MATERIAL 1 *(if different raw material categories are used, please use one copy of this table for each of them)* |
| country / region of origin : ……………………………..list of the supplier(s) names: ……………………………..mass ratio in the total on year base: ………………. %🞎 raw material is not at all wood (less than 5% in mass on year base) then specify: ………………………………………………………………………….🞎 raw material is only partially wood (between 5% and 95% in mass on year base)🞎 raw material is essentially wood (more than 95% in mass on year base)🞎 raw material is guaranteed more than 99% pure wood |
| Type, origin and form of the raw woody material as received | Forest certification system (if any) | Transport data |
| **1) TYPE** *(Check only one box)*🞎 timber wood🞎 wood harvesting residues🞎 wood processing residues🞎 post-consumer (used) wood**2) ORIGIN** *(Check only one box)*🞎 forest harvesting🞎 forest thinning🞎 sanitary cuttings (dead, ill)🞎 short rotation coppices[[1]](#footnote-1) in plantations🞎 wind throw trees🞎 sawmills🞎 wood industry (furniture, carpentry, fibreboards, plywood, etc.)🞎 garden & park cleaning🞎 domestic or industrial waste**3) FORM** *(Check one or several box(es))*🞎 round wood / wood logs🞎 wood chips🞎 wood offcuts🞎 shavings🞎 sawdust🞎 wood bark🞎 stumps/roots🞎 inhomogeneous form | 🞎 **none**🞎 FSC 🞎 PEFC 🞎 CSA-SFM 🞎 SFI 🞎 FFCS 🞎 APSC  | Average distance to the pellet plant………………..kmtype of vehicle :🞎 conveyor belt🞎 truck🞎 train🞎 river boat🞎 other (specify) ………………..Average load per vehicle in ton:………metric ton |

|  |
| --- |
| RAW MATERIAL 2 *(if different raw material categories are used, please use one copy of this table for each of them)* |
| country / region of origin : ……………………………..list of the supplier(s) names: ……………………………..mass ratio in the total on year base: ………………. %🞎 raw material is not at all wood (less than 5% in mass on year base) then specify: ………………………………………………………………………….🞎 raw material is only partially wood (between 5% and 95% in mass on year base)🞎 raw material is essentially wood (more than 95% in mass on year base)🞎 raw material is guaranteed more than 99% pure wood |
| Type, origin and form of the raw woody material as received | Forest certification system (if any) | Transport data |
| **1) TYPE** *(Check only one box)*🞎 timber wood🞎 wood harvesting residues🞎 wood processing residues🞎 post-consumer (used) wood**2) ORIGIN** *(Check only one box)*🞎 forest harvesting🞎 forest thinning🞎 sanitary cuttings (dead, ill)🞎 short rotation coppices[[2]](#footnote-2) in plantations🞎 wind throw trees🞎 sawmills🞎 wood industry (furniture, carpentry, fibreboards, plywood, etc.)🞎 garden & park cleaning🞎 domestic or industrial waste**3) FORM** *(Check one or several box(es))*🞎 round wood / wood logs🞎 wood chips🞎 wood offcuts🞎 shavings🞎 sawdust🞎 wood bark🞎 stumps/roots🞎 inhomogeneous form | 🞎 **none**🞎 FSC 🞎 PEFC 🞎 CSA-SFM 🞎 SFI 🞎 FFCS 🞎 APSC  | Average distance to the pellet plant………………..kmtype of vehicle :🞎 conveyor belt🞎 truck🞎 train🞎 river boat🞎 other (specify) ………………..Average load per vehicle in ton:………metric ton |

**Validation by the auditor**

|  |  |
| --- | --- |
| **Parameter** | **Comments/information** |
| **Geographical origin of the raw material used for making the pellets** | What evidence was available on site to confirm this origin? (e.g. CMR, supplier invoices, supplier contracts, registers….)…………………………Are the average distances validated by checking locations on a map ?………………………… |
| **Type of raw materials** | What evidence was available on site to confirm what type of raw material is used? (e.g. CMR, supplier invoices, supplier contracts, registers, physical evidences on site….)………………………. |
| **Transport systems** | Was the auditor able to confirm the type of vehicles / transport facilities for transporting the raw material to the production site? (visual checking ?)………………………. |
| **Certification systems** | If the delivered raw material is wood certified against a recognised international forestry standard, please mention hereunder the approved certificate numbers or references. Please explain in details what is covered by the wood certification scheme (the pellet producer himself, some of his suppliers, all his suppliers, the raw material, the feedstock, etc…).…………………………….. |

## PART 3 – Pellet production chain

|  |
| --- |
| **General data** |
| Annual production | Recent effective production : | **It should be referred to 12 months operation.** …………………………. metric tons of pellets/yearAlternatively, **for a recently commissioned plant**, please indicate the production volume achieved so far, instead of filling the above. …………………………. metric tons of pellets so far |
| The above reported production report has been achieved during the following period : …………………. |
| Production capacity (*if different*) : | …………………………. metric tons of pellets/year |
| Expected production (*if an expansion is expected*) : | …………………………. metric tons of pellets/year |
| Explain what evidence material has been made available to substantiate the reported annual pellets production.Options include: internal registers, annual reports, sales documents, etc.... | ………………………….………………………….………………………….………………………….………………………….…………………………. |
| Supplier of the processing (mills, densifiers) equipments if applicable | 🞎 Andritz (Sprout-Matador, ADR Geldrop)🞎 California Pellet Mill🞎 Kemyx🞎 Other, specify …………………………….. |
| Date of commissioning of the biomass production plant | MM………………..YY………….. |

The auditor must describe the pellet production process, focusing on the differences with usual practices. Give a detailed description of the process that raw material undergoes.

At each stage, different issues might play a role in the calculation of the net fossil CO2 emissions and therefore should be mentioned.

|  |  |
| --- | --- |
| **Production stage** | **Description** |
| Raw material delivery, storage and handing |  |
| Raw material preparation (crushing, drying, milling….)[[3]](#footnote-3) |  |
| Pelletizing |  |
| Pellet storage, handling and shipping |  |

The description has to be illustrated by a minimal set of pictures: at least the following pictures are required

* + - Raw material storage
		- Overview of pellet manufacturing plant
		- Dryer(s) (if any)
		- Press(es)
		- Pellet storage and handling

A plot plan of the facilities and / or a flowchart should also be added if available.

|  |
| --- |
| **Only if no drying is operated, this table has to be considered and filled in.** |
| Moisture content | initial moisture of the raw material, as received | ................ % (wet basis)  |
| With reference to its origin, explain why the moisture content of the raw material is sufficiently low to make possible the production of pellets without prior drying  | ................ ................ ................ ................ ................................ ................ ................ ................ ................ |
| Pellet moisture content | .... % (wet basis) |

|  |
| --- |
| **Only if a drying is operated,** this table has to be considered and filled in. |
| Dryer information  | Manufacturer | *………………* |
| Type | 🞎 drum dryer🞎 belt dryer🞎 other (specify)………………………… |
| Energy carrier*(the energy carrier is the transfer medium circulated in pipes and used to transport the heat from the boiler/burner to the dryer)* | 🞎 steam🞎 hot water🞎 hot air / flue gases🞎 other (specify)………………………… |
| Heat consumption*If a heat meter is installed, calculate how much heat energy from the boiler is provided to the dryer and give the details of the calculation**If no heat meter is installed, no figure has to be provided* | 🞎 heat meter installed :  consumption = .........................kWh / ton reference period..................................... details of the calculation......................... ............................................................... |
| 🞎 no heat meter installed (no figure can be provided) |
| Boiler / Burner / CHP information | Origin of the heat used in the drying process*If a CHP is installed, specify CHP efficiency*  | 🞎 conventional biomass boiler/burner🞎 conventional fossil fuel boiler/burner🞎 biomass CHP (combined heat and power)🞎 fossil fuel CHP (combined heat and power) |
| CHP efficiency ...........% = (valorised heat + net electricity) / primary energy input |
| Moisture content | initial moisture of the raw material | ................ % (wet basis)  |
| If the raw material (or a part of raw material) is not fresh wood (moisture contents <45%) explain why the moisture contents is so low (e.g. wood from dead trees, sawdust from an industry working with dry material...) | ................ ................ ................ ................ ................................ ................ ................ ................ ................................ ................ ................ ................ ................ |
| moisture of the raw material at the dryer outlet, if measured (target moisture) | ................... % (wet basis) |
| moisture of the pellets (final moisture) | ................... % (wet basis) |

What evidence / explanation was made available to the auditor to substantiate the moisture contents of the raw material:

🞎 weighted average of moisture measurements performed on each individual raw material shipment (one measurement per delivery)

🞎 typical values based on some moisture measurement (number of measurements available = .............)

🞎 supplier / process specifications (documents available :...............................)

🞎 other explanation : ...........................................................................

🞎 no evidence or explanation available

## PART 4 –Energy balance

For each of the energy sources used in the production process, a detailed evaluation has to be provided, using the tables on the next pages. The description is based on three categories of energy sources: electricity, fossil primary energy, non fossil primary energy (biomass)

**Electricity**

|  |  |  |
| --- | --- | --- |
| Give the origin of the **electricity** used in the pellet production process. | 🞎 from network🞎 own generation🞎 genset🞎 **fossil** cogeneration plant🞎 **bio**cogeneration plant🞎 wind or solar farm🞎 other (specify)…………………………… | \_ \_ \_ %\_ \_ \_ %\_ \_ \_ %\_ \_ \_ %\_ \_ \_ %\_ \_ \_ % |
| If the electricity is from the network, please indicate how many kWh-meters cover the pellets production unit : | …………………………………………………. |
| Electricity consumption  | …………………………kWh / metric ton pellets |
| List the process steps/machineries using electricity :  | …………………………………………………. |
| Explain **how** this energy consumption has been **evaluated** : *The* ***calculation method*** *based on electricity i****nvoices*** *is the most accurate and reliable one .This method must be used if feasible.* *The* ***reference period*** *to assess electricity consumption must be* ***one year*** *unless it can be justified that it is not feasible (e.g. newly commissioned facilities)* | 🞎 invoices of external electricity supplier and achieved pellet production, on the following period: …………………………………………🞎 specific fuel consumption and electrical efficiency of installed cogeneration plant and pellet production 🞎 a theoretical evaluation based upon specific consumptions of installed machinery and nominal production capacity of the plant. 🞎 Other explanation: .................................................................... |
| If the calculation method is not based on invoices verification, explain why : | *....................................................................* |
| If another reference period than 12 months has been used to assess the specific electricity consumption, justify why : | *....................................................................* |
| Give the full calculation that leads to the above mentioned energy consumption :  | *....................................................................**....................................................................* |

**Natural Gas**

|  |  |
| --- | --- |
| Give the Natural gas specification used as energy source in the pellet production process.If any natural gas is used, specify in which part of the process : | 🞎 handling 🞎 chipping / crushing 🞎 drying🞎 other (specify)………………………. |
| Fuel consumption *Report the natural gas consumption in terms of energy* ***and*** *in terms of volume* | ………………………… MJ / metric ton pellets…………………………Nm³ / metric ton pellets |
| Fuel specification (based on invoice or supplier specific information) | Natural gas energy content (average).................... MJ/Nm³ This energy content is stated in terms of🞎 Lower Heating Value (LHV) / Net Calorific Value (NCV)🞎 Upper Heating Value (UHV) / Gross Calorific Value (GCV) |
| Name of the natural gas supplier | …………………………………………………. |
| Step of the process/machinery natural gas | …………………………………………………. |
| Explain **how** this energy consumption has been **evaluated** :  | 🞎 invoices of fuel suppliers, for the following period: ……………………………..🞎 fuel consumption monitored by the supplier for the following period: ………………………………🞎 other explanation: .................................................................... |
| Give the full calculation that leads to the above mentioned energy consumption :  |  |

**Other fossil fuels**

|  |  |
| --- | --- |
| Give the specification of any other **fossil** primary energy (except natural gas) used as energy source in the pellet production process.If any fossil fuel is used, specify in which part of the process :🞎 handling 🞎 chipping / crushing 🞎 drying🞎 other (specify)………………………. | 🞎 industrial gas🞎 diesel oil🞎 propane🞎 waste heat fossil boiler (specify fuel)........ 🞎 waste heat fossil CHP (specify fuel)........ 🞎 other (specify)……………………….  |

Each fossil energy source has to be described in details in the table hereunder. Use as many copies of this table as necessary in order to cover each fossil fuel.

|  |  |
| --- | --- |
| **Fossil fuel 1** *(specify):* ………………….. |  *(use one table for each applicable fossil energy)* |
| Fuel consumption *(please report in litre or kg for liquid fuel, and in kg for solid fuels)* | …………………………litres / metric ton pellets…………………………kg / metric ton pellets |
| Step of the process/machinery using fossil fuels | …………………………………………………. |
| Explain **how** this energy consumption has been **evaluated** :  | 🞎 invoices of fuel suppliers, for the following period: ……………………………..🞎 fuel consumption monitored by the supplier for the following period: ………………………………🞎 a theoretical evaluation based upon specific consumptions of installed machinery🞎 other explanation: .................................................................... |
| Give the full calculation that leads to the above mentioned energy consumption :  |  |

|  |  |
| --- | --- |
| **Fossil fuel 2** *(specify):* ………………….. |  *(use one table for each applicable fossil energy)* |
| Fuel consumption *(please report in litre or kg for liquid fuel, and in kg for solid fuels)* | …………………………litres / metric ton pellets…………………………kg / metric ton pellets |
| Step of the process/machinery using fossil fuels | …………………………………………………. |
| Explain **how** this energy consumption has been **evaluated** :  | 🞎 invoices of fuel suppliers, for the following period: ……………………………..🞎 fuel consumption monitored by the supplier for the following period: ………………………………🞎 a theoretical evaluation based upon specific consumptions of installed machinery🞎 other explanation: .................................................................... |
| Give the full calculation that leads to the above mentioned energy consumption :  |  |

**Biomass primary energy**

|  |  |
| --- | --- |
| Give the specification of any **non fossil** primary energy used as energy source in the pellet production process.If any biomass is used, specify in what part of the process :🞎drying🞎 other (specify)………………………. | 🞎 wood pellets 🞎 sawdust / shavings🞎 wood chips🞎 logs / round wood🞎 branches, offcuts, tree stumps....🞎 barks🞎 non woody biomass (specify) ………………………………… |

Each biomass energy source has to be described in detail in the table hereunder. Use as many copies of this table as necessary in order to cover each type of biomass fuel.

|  |  |
| --- | --- |
| **Biomass fuel 1** *(specify):* ………………….. |  *(use one table per applicable biomass fuel)* |
| Moisture contents | ............................% wet basis |
| Origin of the biomass used as energy source in the process (please check only one box; if several boxes are applicable, use one more copy of this table) | Origin🞎 diverted from pellet process🞎 from sawmills / wood industry🞎 from forest harvesting/thinning🞎 other.... Transport🞎 locally available (i.e. from own process or from next door sawmill or industry)🞎 transported by 🞎 truck🞎 train on …………….. km |
| Fuel consumption  | ton biomass/ton pellets: ……………………. |
| Give the full calculation that leads to the above mentioned fossil fuel consumption | ……………………. |

## PART 5 – Transportation of the delivered pellets

**Transport scheme**

*(for each relevant item of the transport scheme check the applicable box and fill in the related details)*

|  |
| --- |
| 🞎 **Inland road transportation**  |
| Road distance **K**=...………………. kmLoad of the trucks  **Q**=...…………metric tons | Transport to:City/Town of …………………….…🞎 train station🞎 sea harbour🞎 river harbour🞎 power plant | Truck powered by:🞎 fossil diesel oil🞎 bio-diesel🞎 bio-ethanol🞎 other ................................................. |

|  |
| --- |
| 🞎 **Inland rail transportation** |
| Distance **K**=...…………………. km | Station of origin:City/Town of ………………………Transport to:City/Town of ………………………🞎 train station🞎 sea harbour🞎 river harbour🞎 power plant | Train powered by:🞎 electricity🞎 diesel oil🞎 bio-diesel🞎 other ................................................. |

|  |
| --- |
| 🞎 **Inland river transportation (flatboats)** |
| Distance **K**=...…………………. kmLoad of the boat  **Q**=...…………metric tons | River harbour of origin:City/Town of ………………………Transport to:City/Town of ………………………🞎 sea harbour🞎 power plant | Boats powered by:🞎 fossil diesel oil🞎 bio-diesel🞎 other ................................................. |

|  |
| --- |
| 🞎 **International sea or river transportation** |
| Sea Harbour of origin: From City/Town of ………………………Transfer to: *ARAG port area[[4]](#footnote-4)* | Contract type🞎 Free-on-Board (*FOB*)🞎 Cost Insurance Freight (*CIF*) |

**Validation**

The auditor has to review the information delivered here above and verify the data focusing on two parameters that play indeed an important role in the CO2 emissions:

* type of vehicles used for transport (*visual check of vehicles / transport facilities on site*)
* destination and distances (*to be checked on a map*)

The auditor must add a map and possible comments about the validation of the transport scheme.

……………………………………………………………….

……………………………………………………………….

……………………………………………………………….

……………………………………………………………….

map :

## PART 6 – Contact details and audit report signature

**Coordinates of the auditor**

|  |  |
| --- | --- |
| **Title (Mr/Mrs/Dr)** | ……………………………….. |
| **Name of the auditor** | ……………………………….. |
| **Name of the verification company** | ……………………………….. |
| **Address**  | Street:………………………………………………………..City:……………………………….Postcode:………………Country:…………………………………………………….. |
| **Contacts** | Tel :………………………………………………………….Fax: …………………………………………………………e-mail:………………………………………………………. |

**Signature of the auditor**

|  |  |
| --- | --- |
| **Date** | DD/MM/YYYY |
| I certify that the data gathered in this form has been checked and validated**Signature****And stamp** |  |

**---------------------------------Part to be filled in by SGS Belgium---------------------------------------------**

|  |  |
| --- | --- |
| **Supplier code** |  **\_ \_ \_-\_ \_** |
| Date and place | DD/MM/YYYY, …………………………….……………… . |
| Name of the reviewer | ………………………………………………………….…… |
| I certify that the data gathered in this document has been checked and validated **Signature and stamp** ***SGS Belgium*** |  |

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***Contact information :***

### Follow-up verification suppliers to Engie/Electrabel

Bolivarlaan 34-36, B-1000 Brussels, BELGIUM

Toon Bosmans

Tel.: +32 (0)2 519 36 92 Mob. +32 471 34 81 80
e-mail : toon.bosmans@engie.com

### Technical specifications and verification process: Laborelec

Rodestraat 125, B-1630 Linkebeek, BELGIUM

Dr.Ir. Yves Ryckmans

Tel. :+32 2 382 03 03 Fax: +32 2 382 02 41 Mob.: +32 478 65 24 48

e-mail : yves.ryckmans@engie.com

### Inspection and independent reporting: SGS Belgium

Parc Créalys, rue Phocas Lejeune 4, B-5032 Gembloux, BELGIUM

Ir. François Ducarme

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e-mail: francois.ducarme@sgs.com

1. Short rotation coppices are wood originating from quick growing vegetal species such that the grown biomass is harvested on a periodic base being maximal 8 years after the first planting of after the first harvest. [↑](#footnote-ref-1)
2. Short rotation coppices are wood originating from quick growing vegetal species such that the grown biomass is harvested on a periodic base being maximal 8 years after the first planting of after the first harvest. [↑](#footnote-ref-2)
3. If any raw material enters the site as logs, please specify clearly what machinery is used to crush the logs before they can enter the process together with the rest of the raw material. In particular, the energy source used for this crushing has to be stated and mentioned in section 4 of the document. [↑](#footnote-ref-3)
4. ARAG port area = set of harbours in Belgium and the Netherlands including Antwerp, Rotterdam, Amsterdam and Ghent [↑](#footnote-ref-4)