SBP audit report on Energy and GHG data (SAR)

# (For Biomass Producers)

## SBP certificate Holder number: [In format XX-YY]

## SBP Certificate Holder name:

## Reporting period: Dates To / From

## Static Date References (SDIs) included in this report: [In format XX-YY-ZZ]

## 

# GENERALITIES

## PART 1 – Administrative information

**Basic information on the Certification Body (CB)**

|  |  |
| --- | --- |
| **Date of audit (on site)** |  |
| **Name of the Certification Body** |  |
| **Audit team members** |  |
| **Qualifications of team members** |  |

**General Information on the legal owner**

|  |  |
| --- | --- |
|  |  |
| **Company name** |  |
| **Contact person on site** |  |
| **Contact person’s function** |  |
| **e-mail** |  |
| **Address** (physical location of the biomass production unit)  **Telephone** |  |
| **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 of biomass production unit:** | ……………………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)* |  |

**Operating licence of the legal owner**

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

**Certifications held by the legal owner (if applicable)**

|  |  |
| --- | --- |
| Certification type and reference number  (SBP, ISO 9001:2000, ISO 14001:2004, SA 8000:2001, Other…) | ……………………………………………………………….  ………………………………………………………………. |
| Place and date of issue | …………………………….……………… , DD/MM/YYYY |
| Certification Body | ……………………………………………………………….  ………………………………………………………………. |

## Geographic location of the production unit

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

## SECTION A: Input Groups for Biomass Production

## Feedstock sourcing and certification

**Introduction**

This part has been designed for essentially **woody biomass.**

Nevertheless, please mention any other type of bio fuel that is used as feedstock if applicable.

On the next pages, it is necessary to list all the main sources of feedstock suppliers for each Input Group for Biomass Production.

Input Groups for Biomass Production shall be defined in compliance with the requirements specified in Instruction Document 5B, section 4.1 Setup of Input Groups for Biomass Production.

This Section (A) shall be completed for each Input Group for Biomass Production. **Use as many copies of the table as needed**.

**Description of the Input Groups for Biomass Production**

|  |  |  |
| --- | --- | --- |
| FEEDSTOCK ID#  *(if different Input Groups for Biomass Production are used, please use one copy of this table for each.)* | | |
| country / region of origin : …………………………….. |  | mass ratio (this Input Group for Biomass Production / Total feedstock) for the Reporting Period: ………………. % |
| **Type, origin and form of the feedstock as received** |  | **Transport data** |
| **1) TYPE** *(Check only one box),*  🞎 primary feedstock from forests (products or residues)  🞎 woody energy crops (primary feedstock)  🞎 wood industry residues (secondary feedstock)  🞎 post-consumer wood (tertiary feedstock)  **2) PHYSICAL FORM** *More than one physical form is allowed in one group)*  🞎 saw dust  🞎 shavings  🞎 wood offcuts  🞎 wood chips  🞎 wood bark  🞎 round wood  🞎 wood logs  🞎tree bark  🞎 tree stumps  🞎 inhomogeneous form  **3) Certification system**  *(Check one or several box(es))*  🞎 **none**  🞎 FSC  🞎 PEFC  🞎 SFI  🞎 Other (specify) |  | Select all types of vehicle used:  🞎 conveyor belt  🞎 truck  🞎 train  🞎 river boat  🞎 other (specify)  Maximum distance to the Biomass Producer per vehicle type used: ………………..km  Average distance to the Biomass Producer per vehicle type used: ………………..km  Average load per vehicle ton:  ………..............metric ton  **In-forest use of chemicals**  *To be completed in compliance with ID5B section 5.2.*  *Per metric tonne of feedtsock*:   1. Mass fertiliser in kg/metric tonne:   N: …………………………..  P2O5:……………………….  K2O:…………….. …………  CaO…………………………   1. Type of pesticide used:   ...........................................  kg active substance/metric tonne:  ...................................……  **Energy use in forestry operations and chipping**  *To be completed in compliance with ID5B section 5.3.*  *Mass/Volume of fuel used per metric tonne of feedtsock*:   1. Type of fuel used:   ........................................... |

## In-forest use of chemicals (fertilisers)

To be completed in compliance with ID5B section 5.2

* Tier 1: Fertiliser is rarely used in forestry, except in short rotation systems.

In traditional forestry, the default will be 0.

In short rotation systems, the values from Biograce will be used.

* Tier 2: The doses of fertiliser applied on the land throughout the rotation period need to be reported in kg fertiliser/metric tonne harvested wood (taking into account the total amount of wood harvested during the rotation period).

Each type of fertiliser has to be reported separately, e.g. N, P2O5 and K2O.

Other types of fertiliser and other components of fertilisers do not need to be reported.

## In-forest use of chemicals (pesticides)

To be completed in compliance with ID5B section 5.2.

* Tier 1: The default value from Biograce can be used:

0.07654 kg/metric tonne round wood

This value has been established for short rotation systems but can also conservatively be applied to traditional forestry.

* Tier 2: The dose of pesticide used in the forest throughout the rotation period needs to be reported in kg active substance/metric tonne harvested wood (taking into account the total amount of wood harvested during the rotation period). The concentration of the active substance is taken into account in the calculation.

## Energy use in forestry operations and chipping

To be completed in compliance with ID5B section 5.3.

As energy expenses in forestry are difficult to monitor, tier 1 or 2 can be used instead of tier 3.

* Tier 1: In the absence of readily available data a default value may be used:
  1. litre diesel / metric tonne round wood (computed from Biograce)
* Tier 2: If there are specific data based on statistics for the relevant region, they can be used.
* Tier 3: All the fuel use throughout the rotation period is reported.

The amount is divided by the total amount of wood harvested during the rotation period (litre fuel / metric tonne round wood)

**Other relevant information, including justifications for data provided and methodologies used.**

**Validation by the CB**

|  |  |
| --- | --- |
| **Parameter** | **Comments/information** |
| **Geographical origin of the feedstock 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 feedstocks** | What evidence was available on site to confirm what type of feedstock 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 feedstock to the production site? (visual checking?)  ………………………. |
| **Certification systems** | If the delivered feedstock 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 biomass producer itself, some of its suppliers, all of its suppliers, the feedstock, etc…).  …………………………….. |

# SECTION B: Energy use for biomass production

## PART 2 – Biomass production chain

|  |  |  |
| --- | --- | --- |
| **General data** | | |
| Annual production | Recent effective production: | **Data should be based on the reporting period**  …………………………. metric tonnes of pellets/year  Alternatively, **for a recently commissioned plant**, please indicate the production volume achieved so far, instead of filling the above.  …………………………. metric tonnes of pellets so far |
| The above reported production report has been achieved during the following period: …………………. |
| Production capacity | …………………………. metric tonnes of pellets/year |
| Expected production (*if an expansion is expected*) : | …………………………. metric tonnes of pellets/year |
| CB. 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) equipment if applicable | | 🞎 Andritz (Sprout-Matador, ADR Geldrop)  🞎 California Biomass Mill  🞎 Kemyx  🞎 Other, specify …………………………….. |
| Date of commissioning of the biomass production plant | | MM………………..YY………….. |

Describe the biomass production process, focusing on the differences with usual practices. Give a detailed description of the process that feedstock undergoes.

In particular, at each stage, elements that might influence the calculation of the net fossil CO2 emissions should be mentioned.

|  |  |
| --- | --- |
| **Production stage** | **Description** |
| Feedstock delivery, storage and handing |  |
| Feedstock preparation (crushing, drying, milling….)[[1]](#footnote-1) |  |
| Pelletising |  |
| Biomass storage, handling and shipping |  |

The description shall be illustrated with a minimal set of pictures: at least the following pictures are required

* + - Feedstock storage
    - Overview of biomass manufacturing plant
    - Dryer(s) (if any)
    - Press(es)
    - Biomass 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 completed.** | | |
| Moisture content | initial moisture of the feedstock, as received | ................ % (wet basis) |
| With reference to its origin, explain why the moisture content of the feedstock is sufficiently low to make possible the production of pellets without prior drying | ................ ................ ................ ................ ................  ................ ................ ................ ................ ................ |
| Biomass 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 / metric tonne  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 feedstock | ................ % (wet basis) |
| If the feedstock (or a part of feedstock) 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 feedstock at the dryer outlet, if measured (target moisture) | ................... % (wet basis) |
| moisture of the pellets (final moisture) | ................... % (wet basis) |

**Other relevant information, including justifications for data provided and methodologies used.**

**Validation by the CB**

|  |
| --- |
| CB. What evidence / explanation was made available to the auditor to substantiate the moisture contents of the feedstock:  🞎 weighted average of moisture measurements performed on each individual feedstock 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 2 –Energy use

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, and non-fossil primary energy (biomass)

**Electricity**

|  |  |  |
| --- | --- | --- |
| Give the origin of the **electricity** used in the biomass 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 tonne 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 biomass production, on the following period: …………………………………………  🞎 specific fuel consumption and electrical efficiency of installed cogeneration plant and biomass production  🞎 a theoretical evaluation based upon specific consumptions of installed machinery and nominal production capacity of the plant.  🞎 Other explanation: .................................................................... | |
| CB. If the calculation method is not based on invoices verification, explain why: | *....................................................................* | |
| CB. If another reference period than 12 months has been used to assess the specific electricity consumption, justify why: | *....................................................................* | |
| CB. Validate the full calculation that leads to the above mentioned energy consumption: | *....................................................................*  *....................................................................* | |

**Natural Gas**

|  |  |
| --- | --- |
| Give the Natural gas specification used as energy source in the biomass 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 tonne pellets  …………………………Nm³ / metric tonne 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 | …………………………………………………. |
| CB. 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: .................................................................... |
| CB. Validate 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 biomass 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 detail 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)* | …………………………. MJ / metric tonne  …………………………litres / metric tonne pellets  …………………………kg / metric tonne pellets |
| Step of the process/machinery using fossil fuels | …………………………………………………. |
| CB. 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: .................................................................... |
| CB. Validate 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)* | …………………………. MJ / metric tonne  …………………………litres / metric tonne pellets  …………………………kg / metric tonne pellets |
| Step of the process/machinery using fossil fuels | …………………………………………………. |
| CB. 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: .................................................................... |
| CB. Validate the full calculation that leads to the above mentioned energy consumption: |  |

**Bio fuel primary energy**

|  |  |
| --- | --- |
| Give the specification of any **non-fossil** primary energy used as energy source in the biomass 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 bio 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 bio fuel.

|  |  |
| --- | --- |
| **Bio fuel 1**  *(specify):* ………………….. | *(use one table per applicable bio fuel)* |
| Moisture contents | ............................% wet basis |
| Origin of the bio fuel (please check only one box; if several boxes are applicable, use one more copy of this table) | Origin  🞎 diverted from biomass 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 | tonne bio fuel/tonne pellets: …………………….  MJ / metric tonne: …………………………. |
| CB. Validate the full calculation that leads to the above mentioned fossil fuel consumption | ……………………. |

**Other relevant information, including justifications for data provided and methodologies used.**

# SECTION C: Energy use for transport of biomass

This Section (C) shall be completed for each Static Data Indicator (SDI).

Use as many copies of the table as needed to describe each SDI.

**Static Data Indicator:** [XX-YY-ZZ]

## PART 1 –General transport data

**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**=...………………. km  Load of the trucks  **Q**=...………metric tonnes | 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**=...…………………. km  Load 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: *Destination port area* | Contract type  🞎 Free-on-Board (*FOB*)  🞎 Cost Insurance Freight (*CIF*) |

|  |
| --- |
| **Validation by CB**  The auditor has to review the information delivered above and verify the data focusing on two parameters that play 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.  ……………………………………………………………….  ……………………………………………………………….  ……………………………………………………………….  ………………………………………………………………. |

**Geographic map:**

## PART 2 –Sea transport

|  |  |  |
| --- | --- | --- |
| **Reference biomass transported** | ……………………………………………………………… | |
| **Name of the transport company** | ……………………………………………………………… | |
| **Address** | Street:…………………………………………………………..  City:……………………………….Postcode:…………………  Country:………………………………………………………….. | |
| **Contacts** | Tel :………………………………………………………………..  Fax: ……………………………………………………………….  e-mail:…………………………………………………………. | |
| **Harbour of departure**  🞎 sea harbour  🞎 river harbour | City/Town: ……………………………  Country : ……………………………... | |
| **Contract type** | 🞎 Free-on-Board (*FOB*)  🞎 Cost Insurance Freight (*CIF*) | |
| **Capacity of the whole ship used**  (whether be full or partial load) | **Nominal capacity Q =**  🞎 Panamax: 70 000 metric tonnes  🞎 Supramax: 55 000 metric tonnes  🞎 Handysize: 35 000 metric tonnes  🞎 Small ships: 3 000 metric tonnes  🞎 Other (specify)………………. metric tonnes | |
| **Backhaul**  Can you deliver evidence that backhaul is applied for the whole journey? | 🞎 ALWAYS  🞎 SOMETIMES, then please explain  🞎 NEVER | |
| **Approx. distance to destination port:**  **Number of days of sea :** | **S**=...………………………….. sea miles  **D**=...………………………….. days | |
| **TOTAL energy consumption for the sea transport**  **L**=...…………………metric tonnes/day  **L x D**=...……………metric tonnes total | Type of used fuel by vessel  🞎 Heavy Fuel Oil  🞎 Medium Diesel Oil 🞎 Light Diesel  🞎 Bio-Diesel  🞎 other, specify | Heating value (GJ/ton)  **H**=...…………………  **H**=...…………………  **H**=...…………………  **H**=...…………………  **H**=...………………… |

## PART 3 –Storage, handling and trans-shipment

|  |  |
| --- | --- |
| **Description of any storage, handling or trans-shipment** |  |
| **Quantity of biomass handled at the different storage, handling and trans-shipment locations** |  |
| **Energy usage data** |  |
| **Justification for the approach followed and the values provided** |  |

**Other relevant information, including justifications for data provided and methodologies used.**

## Contact details and audit report signature

**Certificate Holder**

|  |  |
| --- | --- |
| **Date** | DD/MM/YYYY……………………… |
| **Name, signature and optionally stamp of representative filling in the declaration** | …………………………………………………………………….. |

**Auditor**

|  |  |
| --- | --- |
| Title (Mr/Mrs/Dr) | ……………………………….. |
| Name of the auditor | ……………………………….. |
| Name of the Certification Body | ……………………………….. |
| 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 in compliance with SBP Standard #5 and our SBP certification procedures.  **Signature** |  |

**Technical reviewer**

|  |  |
| --- | --- |
| Date and place | DD/MM/YYYY, …………………………….……………… . |
| Name of the reviewer | ………………………………………………………….…… |
| I certify that the data gathered in this form has been checked and validated in compliance with SBP Standard #5 and our SBP certification procedures.  **Signature** |  |

**Certification decision maker**

|  |  |
| --- | --- |
| Date and place | DD/MM/YYYY, …………………………….……………… . |
| Name of the Certification decision maker | ………………………………………………………….…… |
| I certify that the data gathered in this form has been checked and validated in compliance with SBP Standard #5 and our SBP certification procedures.  **Signature** |  |

1. If any feedstock 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 feedstock. In particular, the energy source used for this crushing has to be stated and mentioned in section 4 of the document. [↑](#footnote-ref-1)