SBP Audit Report (SAR) on Energy and Carbon Data for Pellets

for Biomass Producers producing pellets[1]

SBP certificate holder number: [SBP-01-57]

SBP certificate holder name: State Forestry Institution 'Begoml Forestry Enterprise'

Please visit www.sbp-cert.org for more information about the biomass producer

Reporting period. Reporting period (should be based on 12 months) and the start date should not be older than 18 months from the audit date.

From: 01/07 /2019
To: 01 / 06 / 2020

SAR expiry date: 07/09/2020

[1] and woodchips if both stationary chipping and thermal treatment are carried out on a separate processing site.

Contents

1. Generalities

1.1. General information on the Biomass Producer

Company name	Begoml Forest Enterprise
Contact person on site	Nadzeya Polochanina +375-29-3919601 Email: kach_begom@vitebsk.mlh.by
Contact person's function	Quality Engineer
E-mail address	glhu_begoml@vitebsk.by
Address (physical location of the biomass production unit, pellet plant or woodchips processing unit)	Yukhnovtsa street, 21, 211730,Begoml, Dokshitsy district, Vitebsk region, Belarus
Telephone	+375215753144
DBSD enabled? (has BP established the system for feedstock groups and is allowed to use the 99 code in DTS)	Yes

1.2. Justifications for data provided and methodologies used

This space made be used to provide additional information appropriate to the whole SAR, for example selection of a reference period other than 12 months or how recording of data has been undertaken for a recently commissioned plant.

1.3. Basic information on the Certification Body (CB)

Date of the audit closing meeting (on site)	07/09/2020
Name of the Certification Body	UAB NEPCon LT
Audit team members	Aliaksandr Zubkevich
Qualifications of team members	Mr. Aliaksandr Zubkevich has an education of engineer-economist in timber industry. He did a postgraduate study at the Belarusian State Technological University. Mr. Zubkevich passed the FSC FM/CoC Lead Auditor training course, as well as the Legal Source, ISO 14001 and SBP training courses. He has experience in assessing woodworking companies and SBP (pre-) assessments in Belarus.
Contact details of the auditor (email)	

2. Feedstock data

2.1. Feedstock Groups – as defined by local industry practice

Guidance: please click on the row and then click on "+" button on the right to add another row.
In case of multiple transport steps for a Feedstock Group proceed by adding one line and merging other columns.
It is not required to include feedstock that is ONLY used as biomass fuel, but optionally this can be done if data are available and verifiable.
If part of the Feedstock Group is diverted as biomass fuel, then consider the TOTAL mass here and add also a corresponding line in Table 3.5

Give the **total** raw mass of feedstock as received used **for biomass production** on the reporting period, **including** shares diverted as biomass fuel.[1]	20060.74	metric tonne as received

A	B	C	D	E	F	G	H	I	J	K	L	M
#	**Feedstock type for biomass production**	**Origin**	**Physical Description**	**Country of harvest (new row for each country)[4]**	**Raw mass as received in metric tonnes**	**Moisture % as received (weighted average, single figure)[2]**	**Weighted average distance (km)**	**Maximum distance (km)**	**Vehicle**	**Powered by**	**Weighted average load of the vehicle**	**Specify any pre-processing. (chipping, drying, none)[3]**
1	Processing residues	Sawmill and wood industry residues	Wood Chips	Republic of Belarus	14997.40	64,6	0,5	0,7	Tractor MTZ-82	diesel oil	2.18	drying
2	Processing residues	Sawmill and wood industry residues	Sawdust	Republic of Belarus	5063,34	64,6	0.5	0.7	Tractor MTZ-82	diesel oil	2.18	drying

[1]**Sum all values in column F of the Table (Letter ID's refer to Instruction Document 5E)**
[2]**Where the moisture content of the feedstock is not recorded, the BP may provide an estimate or use a default value.**

[3] **If chipping outside the forests or drying takes place then please specify the information in the relevant sections 3.3 and 3.4**
[4] **Nation or large region of nation (like State of USA, Province of Canada, Region of Russia)**

2.2. Use of energy and chemicals in forests or plantations for biomass feedstock (optional[1])

Feedstock Group number[2]	Energy use in forestry operations including mobile chipping	Diesel used (l/metric tonne of feedstock)	In forest use of chemicals?	Fertiliser type used	Active substance used (kg/metric tonne of feedstock)
	No		No	Choose an item.	

[1]See instruction Document 5E for default values, which can be used if the table is not filled in
[2]Feedstock Groups to be populated from the previous table

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

Totally used 24470.28 м3. All feedstock is transported by own truck and each truck is equipped with GPS tracking system. Distance was taken from this system. The density coefficient at a moisture content of 64.6% for spruce is 758, for pine 861, the average coefficient for a spruce / pine wood species ratio of 40% / 60% is 0.8198t / m3. The amount of raw materials supplied for the production of fuel pellets in metric tons is 24470.28 m3 * 0.8198 t / m3 = 20060.74 mt

2.4. Validation by the Certification Body

Parameter	Comments/information
Distance and origin of feedstock	What evidence was available on site to confirm this origin? (for example, CMR, supplier invoices, supplier contracts, registers) …… Are the average distances validated by checking locations on a map? ……
Types of feedstock	What evidence was available on site to confirm what type of feedstock is used? (for example, CMR, supplier invoices, supplier contracts, registers, physical evidence on site) ……..
Transport systems	Was the auditor able to confirm the type of vehicles / transport facilities used to transport the feedstock to the production site? (visual checking?) ……..

3. Biomass production

Please see appendix 1 for photos and full description of the production process.
Biomass product can be wood pellets or woodchips or energy logs

3.1. Total production

Annual production	**Actual biomass production on the reporting period (1)**	Production during reporting period	
		9097,4	metric tonnes for the reporting period
	Design capacity:	8000	metric tonnes of biomass product/year
	Average lower heating value:	17.8	MJ/kg (wet basis) average for the reporting period
(CB) What evidence is available to substantiate the reported annual biomass production? Options include: internal registers or annual reports.		1C accountant program	

3.2. Electricity use

Not applicable ☐

Give the origins of the **electricity** used in the biomass production process during the reporting period (2)	☒ from network	1203105 kWh
	☐ on-site generation	.....kWh
	☐ **fossil** cogeneration plant	.....kWh
	☐ **bio-**cogeneration plant	.....kWh
	☐ wind or solar farm	.....kWh
	☐ other (specify)	.....kWh
	Total specific electricity use sum of (2)/(1)	132,25 kWh/metric tonne
Explain **how** this energy consumption has been **evaluated**: *The **calculation method** based on electricity **invoices** is the most accurate and reliable one. This method must be used if feasible.* *Please provide the calculation itself*	☐ invoices of external electricity supplier and biomass production achieved, ☐ specific fuel consumption and electrical efficiency of installed cogeneration plant and biomass production ☐ a theoretical evaluation based upon specific consumption of installed machinery and nominal production capacity of the plant ☒ Other explanation: in the shop for the production of fuel pellets, an electric energy meter is installed for taking readings Calculation 1203105/9097,4=132,25 kWh/metric tonne	

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

3.2.2. Validation by the CB

(CB) What evidence / explanation was made available to the auditor ……

3.3. Moisture content and drying

Is feedstock dried as part of the biomass production process? If <u>no</u>, complete table 3.3.a. If <u>yes</u>, complete table 3.3.b.

3.3.a No drying ☐ Only complete this table if <u>no drying is undertaken</u>.			
Feedstock Moisture content	Initial moisture of the feedstock, as received	……	% (wet basis)
	Explain, with reference to its origin, why the moisture content of the feedstock is sufficiently low to enable the production of biomass product without prior drying.		
	Explain how it is monitored / evaluated?	☐ weighted average of moisture measurements performed on each individual feedstock shipment (one measurement per delivery) ☐ typical values based on some moisture measurement (frequency of measurements = ...) ☐ supplier / process specifications (documents available: .....) ☐ other explanation: ..... ☐ no evidence or explanation available	
Biomass moisture content	Moisture of biomass as produced	……	% (wet basis)

3.3.b Drying applicable ☒ Only complete this table if drying is undertaken. This table must be completed for each type of dryer.			
Moisture content	Initial moisture of the feedstock, as received	64,6	% (wet basis)
	Explain how it is monitored / evaluated Tick all boxes that apply and provide additional information in 3.3 as required	☒ weighted average of moisture measurements performed on each individual feedstock shipment (one measurement per delivery) ☐ typical values based on some measurements (frequency of measurements = ...) ☐ supplier / process specifications (documents available: .....) ☐ default values e.g. for round wood ☐ other explanation: ☐ no evidence or explanation available	
	Moisture of feedstock at the dryer outlet, if measured (target moisture)	10,0	% (wet basis)
	Moisture of the finished biomass product (as produced)	10,44	% (wet basis)
Dryer	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 details of the calculation.	☐ heat meter installed: consumption = ...kWh ☒ no heat meter installed	
	Detailed calculation of the heat consumption	.....	
	Origin of the heat used in the drying process	☐ burner ☒ conventional boiler ☐ CHP (combined heat and power)	

3.3.c Information if a conventional boiler is used

Not applicable ☒

Share of fossil fuels in primary energy from fossil/biomass fuels	.....	%
Total heat output from boiler that is effectively recuperated and used in an application during reporting period	.....	kWh
Total heat output from boiler that is used in drying during reporting period	.....	kWh
How has this data been calculated (e.g. metered data, theoretical calculation based on specific consumption of installed machinery)		

3.3.d Information if a CHP is used

Not applicable ☒

Share of fossil fuels in primary energy from fossil/biomass fuels	.....	%
CHP efficiency (net conversion efficiency of the input fuels into		
(1) heat	.....	%
(2) heat that is effectively recuperated and used in the plant	.....	%
(3) net electricity) / primary energy input	.....	%
Temperature of the energy carrier at the point of use	.....	°C
Total heat output from CHP that is effectively recuperated and used in an application during reporting period	.....	kWh
Total heat output from CHP that is used in drying	.....	
Total electricity output of CHP	.....	
Total electricity from CHP exported from site (e.g. to local network)	.....	
How has this data been calculated (e.g. metered data, theoretical calculation based on specific consumption of installed machinery)		

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

The amount of material used in the dryer is recorded and
thus known – 3692,99 solid m3 of chips.
3692,99 m3*0.8198 t/m3 =3027,51 t
3027,51/9097,4=0,33
0,33*6980 MJ (FAO Wood Fuels Handbook)=2303,4 MJ/ ton
To calculate the MJ per tonne of material FAO Wood Fuels Handbook was used.

3.3.2. Validation by the CB

(CB) What evidence / explanation was made available to the auditor to substantiate the Biomass production chain moisture content of the feedstock and drying of feedstock:

……..

3.4. Use of fossil fuels

Not applicable ☐

Each fossil energy source must be described in detail in the table hereunder. Use as rows as necessary in order to cover each fossil fuel. If any responses are marked as 'other', please include further detail in the box below (also for offsite chipping by third party)

Type of fossil fuels	Total consumption on the reporting period (value)	Units	For gas in Nm³ only specify high or low heating value from invoices	Processing step using fossil fuels	How has this energy consumption been calculated:
Diesel oil	16124,7	litre (liquid only)	N/A	handling	Fuel consumption is registered in 1C

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

The feedstock at the production plant is handled by front loader Amkodor 10-24.

3.4.2. Validation by the CB

(CB) What evidence / explanation was made available to the auditor
……..

3.5. Use of biomass fuels

Not applicable ☐

Use as many rows as necessary in order to cover each type of biofuel and each process.

Feedstock ID Group in Table 2.1 if applicable or NA[1]	Biomass type[2]	Total consumption on the reporting period (value)	Units	Moisture content %as received, point of use	Processing step using biomass fuels	How has this energy consumption been calculated:
Feedstock Group 1	saw mill residues (dust, chips, ...)	3692,99	m3	64,6	boiler for drying	Fuel consumption is registered in 1C

[1]If biomass fuel is diverted from Feedstock Groups, please mention them in column 1.

[2] Each type of biomass used as a fuel must be described per type

3.5.1. Other relevant information, justifications for data and methodologies used

The distance from the plant to the Parafyanov station is 40 km.
The granules are transported by MAZ 642205 truck with a semitrailer. Fuel consumption, according to waybills (according to the dispatcher's data), for the transportation of 1 pellet machine is 23.396 liters (average value).
The car transports 17.3 tons of pellets / aut. (mean).
We get the fuel consumption for the transportation of 1 ton of pellets to the Parafyanov station, it is 23.396 / 17.3 = 1.35 l / t. or 1.35 * 35.86 = 48.41 MJ / t of pellets.
Pellet handling is carried out by a MAZ vehicle with a hydraulic manipulator (MAZ630308). Fuel consumption rate for unloading pellets is 0.19 l of diesel / t, loading into a car - 0.33 l of diesel / t
We get: 0.19 + 0.33 = 0.52 l of diesel / t, or 0.52 * 35.86 = 18.6 MJ / t.

3.5.2. Validation by the CB

(CB) What evidence / explanation was made available to the auditor ……..

4. Transport of biomass

Static Data Indicators (SDIs) included in this report: [In format XX-YY-ZZ]	Description of SDI (This should include geographic location, and where appropriate type of facility (e.g. port) and means of transport to location and any other identifier (e.g. FOB or transfer of ownership)) – 40 characters limit
01-57-06	Factory gate
01-57-05	Transportation to Bigosovo railway station

Please add the number of SDIs as required.

4.1. General transport data

Please complete a column for each SDI.
If the SDIs do not match the format of the table below please change the orientation of the page or transposition the table.

	DATA	01-57-06	01-57-05
Transport leg 1	SDI starting point	factory gate	factory gate
	Distance (km)		40
	Transported to?		Parafyanov railway station
	Mode of transport	Choose an item.	road
	Transport powered by?	Choose an item.	fossil diesel oil
	Transport capacity (tonnes)		20 MT per truck
	Actual fuel use if known (litres)		23.396 l per flight
	Backhaul if known		MAZ 642205
Transport leg 2 (if needed)	Starting location		Parafyanov railway station
	Distance (km)		20
	Transported to?		Krulevshchizna railway station
	Mode of transport	Choose an item.	rail
	Transport powered by?	Choose an item.	fossil diesel oil
	Transport capacity (tonnes)		52 MT per railcar
	Actual fuel use if known (litres)		-
	Backhaul if known		no
Transport leg 3 (if needed)	Starting location		Krulevshchizna railway station
	Distance (km)		91
	Transported to?		Polotsk railway station
	Mode of transport	Choose an item.	rail
	Transport powered by?	Choose an item.	fossil diesel oil
	Transport capacity (tonnes)		52 MT per railcar
	Actual fuel use if known (litres)		-
	Backhaul if known		No
Transport leg 4 (if needed)	Starting location		Polotsk railway station
	Distance (km)		78
	Transported to?		Bigosovo railway station

	Mode of transport	Choose an item.	rail
	Transport powered by?	Choose an item.	fossil diesel oil
	Transport capacity (tonnes)		52 MT per railcar
	Actual fuel use if known (litres)		-
	Backhaul if known		No
	Scope end point	Factory gate	Bigosovo railway station

4.2. Storage of biomass

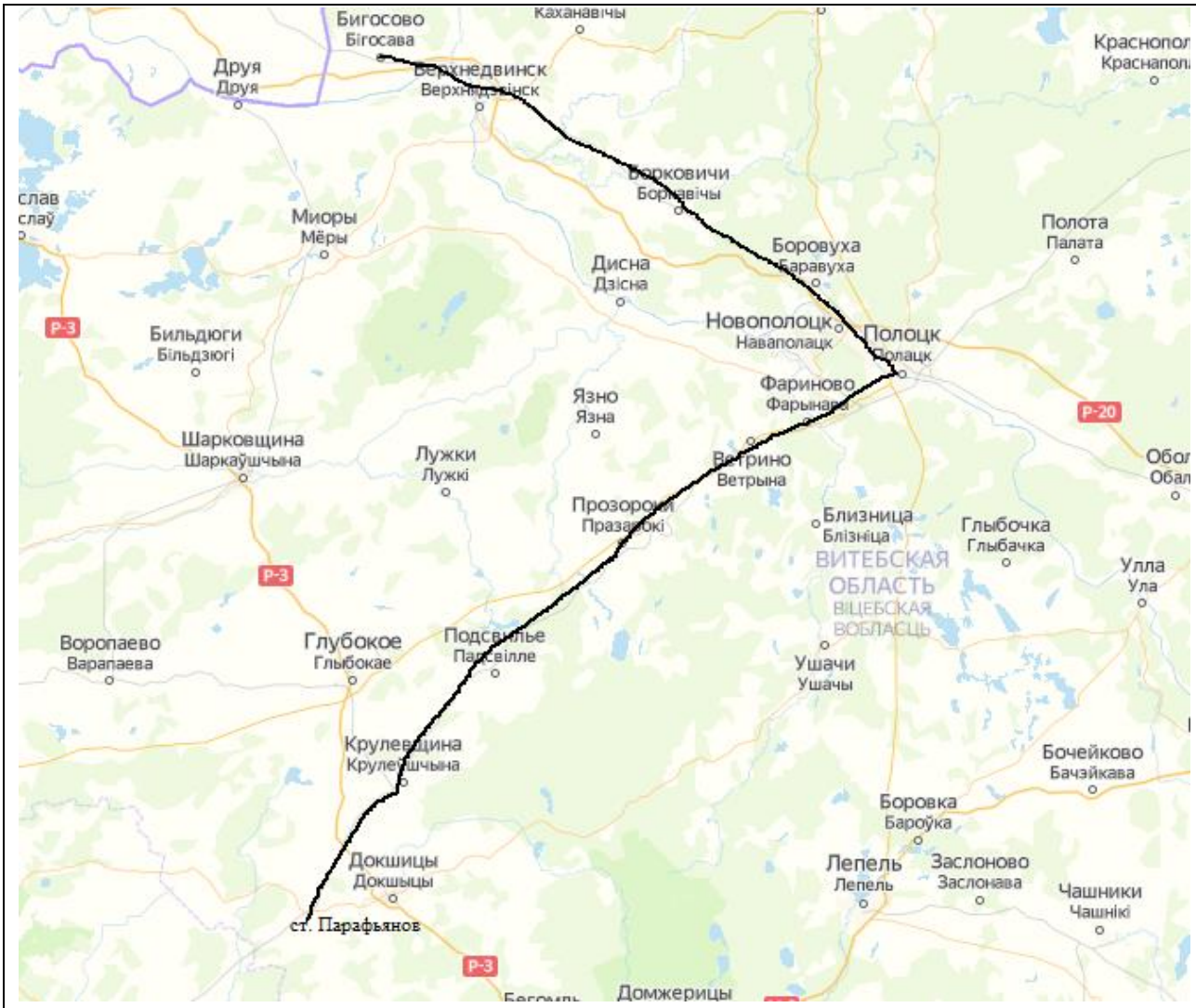
Please indicate address of off-site storage, handling or trans-shipment facility,

Not applicable ☐

Physical address	Parafyanov railway station
Description of activity occurring at this location	Loading of railway wagons by MAZ truck with hydraulic manipulator (MAZ 3630308)
Maximum time of storage	0 days/months
Relevant contact person	Zhdanko Viktar
Telephone / Fax company office	80215754731

4.3. Regional map demonstrating biomass producer and location of SDIs

(One map may be used for multiple SDIs where appropriate)



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

Distance by rail from Parafyanov station to Bigosovo station - 189 km.
(Source: Belarusian Railways website)
Pellets sold for export are transported in grain wagons.
Pellets sold 8946.2 tons.

4.5. Validation by CB

The CB must review the information delivered above and verify the data focusing on two parameters that play an important role in the CO_2 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 CB should comment on the validation of the transport scheme as necessary.

……..

5. Dynamic Batch Sustainability Data (DBSD)

Record all biomass with DBSD during the reporting period that have been shared to the DTS (as defined in Instruction Document 5E clause 5.2).

Biomass Category	Metric tonnes
cat 5	5768.905 mt

5.1.1. Validation by the CB

(CB) What evidence / explanation was made available to the auditor. Has corresponding DTS data been verified??
……..

6. Contact details and audit report signature

6.1. Signature of the Certificate Holder

Date	09/09/2020
Name, signature and optional stamp of representative filling in the declaration	Artem Zemchenok 

6.2. Signature of the Certification Body

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 SBP certification procedures. **Signature**	

6.3. Signature of the verification service provider

Date	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 SBP certification procedures. **Signature**	

6.4. Signature of SBP (and indicate expiry date on the front page)

Date	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 SBP certification procedures. **Signature**	

Appendix 1 Photographs/illustrations

This shall include photographs/illustration/pictures of at least the following:

- Feedstock storage
- Overview of biomass manufacturing plant
- Dryer(s) (if any)
- Wood chippers (green island, dry island)
- Press(es) if wood pellets
- Biomass storage and handling

A ground plan of the facilities and / or a flowchart shall also be included if available.

Appendix 2. Production process

Describe the on-site biomass production process, focusing on any variation from best practices, and including a detailed description of the processes undergone by feedstock.

Feedstock delivery	Weighbridge or other volume measuring	☐ applicable to all feedstock groups ☐ applicable only to feedstock group nr…… ☒ not applicable	
	Moisture monitoring	☒ applicable to all feedstock groups ☐ applicable only to feedstock group nr…… ☐ not applicable	
	Unloading	☐ truck tipping — applicable to feedstock group nr…… ☐ live bottom truck — applicable to feedstock group nr…… ☐ moving floor — applicable to feedstock group nr…… ☒ grab/front end loader/crane — applicable to feedstock group nr…… ☐ hopper/conveyor belt — applicable to feedstock group nr…… ☐ blowpipe — applicable to feedstock group nr…… ☐ other (specify) — applicable to feedstock group nr……	
Feedstock storage		☒ wood yard — applicable to feedstock group nr…… ☐ warehouse — applicable to feedstock group nr…… ☐ silo — applicable to feedstock group nr…… ☐ other (specify) — applicable to feedstock group nr…… ☐ no storage — applicable to feedstock group nr……	
Feedstock handling		☐ rolling stock ☒ conveyor ☐ blowpipe ☐ other (specify)	
Feedstock preparation	Debarking	☐ applicable to all feedstock groups ☐ applicable only to feedstock group nr…… ☒ not applicable	energy source ☐ electricity ☐ diesel ☐ other(specify)
	Chipping	☐ applicable to all feedstock groups ☐ applicable only to feedstock group nr…… ☒ not applicable	energy source ☐ electricity ☐ diesel ☐ other(specify)

	Drying	☒ applicable to all feedstock groups ☐ applicable only to feedstock group nr…… ☐ not applicable	☒ drum dryer (number: …) ☐ belt dryer (number:….) ☐ other(specify) ☐ hot air ☐ hot water ☐ steam	Energy source(s) ☒ biomass burner/boiler ☐ fossil fuel burner/boiler (specify fuel) ☐ own biomass CHP ☐ third party fossil fuel CHP (specify fuel) ☐ own fossil fuel CHP (specify fuel) ☐ third party biomass CHP ☐ steam from biomass CHP ☐ other(specify)
Sizing (hammer mill)	Before dryer (green)	☐ applicable to all feedstock groups ☐ applicable only to feedstock group nr…… ☒ not applicable		
	After dryer	☒ applicable to all feedstock groups ☐ applicable only to feedstock group nr…… ☐ not applicable		
Pelletising		number of presses 1	design capacity of each press 1.7 tonnes/hour	
Product handling		☐ rolling stock, ☐ conveyor belt. ☐ blowpipe, ☒ forklift, ☐ other (specify) …		
Product storage		☒warehouse ☐ silo ☐ open air (woodchips or black pellets) ☐ dome (for pellets) ☐ other (specify) ☐ no storage	maximum storage capacity: 150 tonnes	

In this appendix, please concentrate on elements that might influence the calculation of the net fossil CO_2 emissions (anything which will contribute >1% of the total Carbon emissions).

Other relevant information to the biomass production process not captured anywhere else
