

Instruction Document 5B: Energy and GHG Data

Version 1.1 October 2016

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

Document history

Version 1.0: published 26 March 2015

Version 1.1: published 12 October 2016

Standard Effective Date

SBP certified organisations shall be in compliance with Instruction Document 5A Section 4 “Transaction Claims” in making a transaction claim from 12 October 2016.

For all other sections of Instruction Document 5A and for Instruction Documents 5B and 5C, these are effective from 12 October 2016. SBP certified organisations may implement these Instruction Documents and assessments may be conducted against these Instruction Documents from 12 October 2016.

New certification applicants shall be assessed against this Instruction Document from 01 December 2016 and all surveillance assessments shall be conducted against this Instruction Document from 01 April 2017.

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1 Scope

This document is a normative Instruction Document which accompanies SBP Standard 5: Collection and Communication of Data. It defines the requirements and options for collecting data related to energy and greenhouse gas, which accompany SBP-certified biomass through the supply chain.

1.1 Introduction

The present document covers the following data:

- the description of the feedstock data that is needed for energy and GHG data:
 - o type;
 - o physical form; and
 - o origin.
- the description of the biomass produced:
 - o wood dust;
 - o wood fibres;
 - o woodchips;
 - o white wood pellets; or
 - o black wood pellets.
- the description of the conversion process:
 - o cutting, shredding or milling;
 - o drying and/or thermal treatment like torrefaction or pyrolysis; or
 - o pelleting or briquetting.

Data must be collected by the Legal Owners of the biomass along the supply chain. A Legal Owner can be:

- a Biomass Producer (BP) that creates biomass from feedstock inputs;
- a Trader that takes legal ownership of biomass and supplies to another Legal Owner:
(note that as a legal entity, a trader can also be a BP or an end-user);
- an End-User who eventually uses the biomass as a fuel for heat and/or power generation.

2 General data requirements

2.1 Principles for all Legal Owners

2.1.1 Each Legal Owner shall record all data as specified in either the 'SBP Audit Report for Energy and GHG data' (SAR) or the 'SBP Report on Energy and GHG for Supplied Biomass' (SREG) where production or transportation of feedstock or biomass contributes to Energy or GHG values during the period of legal ownership:

- The 'SBP audit report for Energy and GHG data' (SAR) shall be completed by BPs;
- The SBP Report on Energy and GHG for Supplied Biomass (SREG) shall be completed by traders. BPs shall complete the SREG where biomass is supplied outside the scope of a Static Data Identifier (SDI).

2.1.2 Each Legal Owner shall operate a management system to ensure that data recorded is consistently compliant with the requirements specified in this Instruction Document.

2.1.3 Legal Owners shall make data available using the templates specified in this Instruction Document. The data shall be communicated using a medium agreed between the two parties.

2.1.4 BPs producing only woodchips without further processing¹ or Energy Logs and no other biomass with an SBP-claim, are exempt from all other requirements of this Instruction Document, but shall record the country of origin of feedstock (i.e. the location of the tree stump), and for both incoming feedstock and outgoing biomass (i.e. woodchips or Energy Logs) the means of transportation and either the average haulage distance, the maximum haulage distance or both. In this case, the BP shall pass the specified transport data to the next Legal Owner and, if requested, to the End-User.

2.2 Static Data Identifier (SDI)

2.2.1 The BP shall define Static Data Identifiers (SDIs) as specified in Instruction Document 5A and shall ensure that the relevant Energy and GHG Data is clearly associated with each SDI.

¹ Processing of woodchips is an activity which changes the physical attributes of the woodchips, such as thermal drying, pressing or similar.

3 Data requirements

3.1 The SBP audit report for Energy and GHG data (SAR)

3.1.1 BPs shall record data in an '*SBP Audit Report for Energy and GHG data*' (SAR), using the latest version of the template from the SBP website. The SAR shall be complemented with validation comments and photographs from a CB.

3.1.2 The SAR shall be verified by a CB by evaluating compliance against the requirements set out in this Instruction Document. The CB shall insert comments confirming the data recorded by the BP as indicated in the SAR. The CB shall also insert a minimal set of pictures taken during the audit to confirm the biomass production process and equipment as indicated in the SAR. The SAR must be signed by the responsible CB auditor and shall include the contact details as indicated in the SAR.

3.1.3 The SAR shall be formally approved by SBP before it can be supplied to customers and End-Users.

3.2 Reporting Period

3.2.1 The BP shall specify the Reporting Period for data recorded in the SAR. The default period is 12 months, but other Reporting Periods can be used where appropriate, for example, in the following circumstances:

- new production unit, with commissioning completed less than 12 months prior to the end of the chosen Reporting Period;
- significant changes in equipment or operations, implemented less than 12 months prior to the end of the chosen Reporting Period;
- significant technical changes in the nature of the feedstock, implemented less than 12 months prior to the end of the chosen Reporting Period; and
- physical destruction of all or part of the production facilities and/or of data and related records (for example, fire, flood).

Note: In case of a change of ownership (including a new operating licence held by a different operating company), the data should be transferred from owner to owner, and the Reporting Period should remain unaffected.

3.2.2 Where a Reporting Period other than 12 months is used the BP shall justify the Reporting Period used to the CB, and the justification shall be recorded in the SAR

3.2.3 The BP should select a convenient annual Reporting Period for record keeping (for example, fiscal year, civil year or any other 12-month period).

3.2.4 The BP shall update the data recorded in the SAR at least every 12 months.

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3.2.5 Using data from a period ending more than 15 months prior to the beginning of a Reporting Period is not permitted. Exceptionally, if the BP recommences production after a prolonged period (greater than 6 months) of non-production, then data from the most recent activity period available may be used.

3.2.6 An offset of no more than 15 days is allowed between the Reporting Period and the timeframe of any reported activity data.

Note: This means that the Reporting Period can vary from the actual activity timeframe by up to 15 days before and 15 days after..

3.2.7 If, for any of the data, the total number of days that the data relates to is not exactly the same as the Reporting Period (for example, because of the dates of meter reading, or inventory/invoicing periods) an adjustment to match the data to the Reporting Period shall be made, using a simple proportional relationship. This shall be justified to the CB and shall be recorded in the SAR.

3.2.8 Records of all individual feedstock suppliers relevant to the Reporting Period shall be kept for a period of at least 5 years. The list shall be made available upon request to the verifying CB and energy regulators, and otherwise may be subject to confidentiality requirements specified by the BP.

3.2.9 The Legal Owner shall record the most operationally specific and detailed data that is practically available. The methodology used and the justification for the data recorded shall be recorded in the SAR.

Note: The efforts for the evaluation of specific and detailed data should be proportionate to the relative magnitude of that specific data item to the Energy and GHG balance. Where the BP and the CB consider that a data item is too difficult to record, given the relative significance of that specific data item to the Energy and GHG balance, the BP may request that their CB contact SBP on their behalf. The CB will submit a proposed solution to SBP. In this case, SBP will review the proposed solution and communicate a determination to the CB.

3.3 The SBP Report on Energy and GHG for Supplied Biomass (SREG)

3.3.1 Traders and BPs supplying biomass outside the scope of a Static Data Identifier (SDI) shall record data in a SBP Report on Energy and GHG for Supplied Biomass (SREG), using the latest version of the template from the SBP website.

3.3.2 The SREG shall be verified by a CB during their surveillance activities, against the requirements set out in this Instruction Document.

4 SECTION A: Input Groups for Biomass Production

4.1 Setup of Input Groups for Biomass Production

4.1.1 To ease collection of Energy and GHG Data, all feedstock used in the Reporting Period shall be grouped into Input Groups.

Note: The purpose of Input Groups is to ease the data reporting burden. Once the feedstock in any one Input Group meets the specifications set out in section 4.1.2 below, it can be grouped in a way that makes operational sense to the BP.

4.1.2 A single Input Group shall not include feedstock:

- From more than one of the following classifications:
 - primary feedstock from forests (products or residues);
 - woody energy crops (primary feedstock);
 - wood industry residues (secondary feedstock); or
 - post-consumer wood (tertiary feedstock).
- With significantly different transport distances.

Note: The ratio between maximal and average transport distance should not be over 1.5 (for 90% of the feedstock in that group). Any exceptions should be verified by the CB and explained in the SAR.

- Which is prepared or pre-processed on-site and subsequently mixed with feedstock that is not prepared or pre-processed onsite.

Note: 'Prepared or pre-processed' includes activities such as drying and grinding.

4.1.3 Where feedstock is diverted and used as a fuel in the dryer or CHP, this shall be included in a separate Input Group and identified as such.

4.2 Feedstock description

4.2.1 Feedstock shall be described in every Input Group according to the following classification:

- primary feedstock from forests (products or residues);
- woody energy crops (primary feedstock);
- wood industry residues (secondary feedstock); or
- post-consumer wood (tertiary feedstock).

4.2.2 Feedstock shall be described in every group according to its physical form:

- sawdust;
- shavings;
- wood offcuts;
- woodchips;
- roundwood;
- wood logs;
- bark;
- tree stumps; or
- non-homogeneous form.

More than one physical form is allowed in one group.

5 SECTION B: Energy use for biomass production

5.1 General principles

5.1.1 The BP should operate a system such as log books or electronic code/card systems to allocate the use of fossil fuel to processing or transport.

5.1.2 Allocation of fossil fuel for production should be based on appropriate metering. The fuel allocation system is especially important where the storage is not dedicated to biomass production and some vehicles or machinery unrelated to the biomass production are also able to use the fossil fuel from the same storage. In some cases, a practical alternative may be to measure and record the specific (hourly) fossil fuel consumption of all the machinery/vehicles used, and the number of operating hours.

Note: The BP is not responsible for maintaining such metering systems for third parties supplying feedstock.

5.1.3 The BP shall justify the data and methodology used for reporting energy use to the CB, and this shall be recorded in the SAR.

5.1.4 The natural gas consumption can be reported in terms of energy or in terms of volume when specifying the heating value per unit volume, either in LHV or in UHV.

This energy content is stated in terms of:

- Lower Heating Value (LHV) / Net Calorific Value (NCV); or
- Upper Heating Value (UHV²) / Gross Calorific Value (GCV).

The data recorded should permit calculation of the MJ of natural gas used per tonne pellets produced for the Reporting Period.

5.1.5 Ideally, the BP should operate separate storage (such as a tank or gas store) on site for every type of fossil fuel used exclusively for the purpose of biomass production, with all deliveries throughout the year and the levels of the storage recorded at the beginning and end of the Reporting Period. In this case, the reported amount of fossil fuel is the sum of all deliveries, plus initial contents of the storage, minus final contents of the storage.

5.2 In-forest use of chemicals (including fertilisers and pesticides)

Note: Operational data should only be recorded in the case of primary feedstock from woody energy crops. If data is recorded for this section, then the following requirements apply:

² “Upper Heating Value” also referred to as “Higher Heating Value”

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5.2.1 The BP shall justify the data and methodology used to the CB, and the methodology and justification shall be recorded in the SAR.

5.2.2 If no data can be reported, the BP shall justify this to the CB and the justification shall be recorded in the SAR.

5.3 Energy use in forestry operations and chipping

Note: This section is optional as default values are provided in BioGrace. If data is recorded for this section, then the following requirements apply.

5.3.1 The requirements in this section include the total energy used for soil preparation, planting, forest management methods (such as short rotation forestry) and harvesting of primary feedstock, and include chipping operations undertaken before receipt of feedstock by the BP for forest products and residues.

5.3.2 Chipping undertaken outside the forest but before delivery to the BP shall be included. Chipping undertaken after delivery to the BP is not covered here.

5.3.3 Data specified in this section shall be recorded for primary feedstock including forest residues.

5.3.4 Data shall be reported in litre/ (for fossil fuel) or in kWh/ (in the case of electricity) per metric tonne of wood product harvested during the rotation period or per metric tonne of chips as received.

5.3.5 Data based on statistics for the relevant region can be reported.

5.3.6 Data based on field trial records of specific energy use for in-forest chipping can be reported.

5.3.7 The BP shall justify the data and methodology used to the CB, and the methodology and justification shall be recorded in the SAR.

5.4 Use of primary energy for processing, drying or other types of thermal processing, when applicable

5.4.1 The following information on thermal processing (when applicable) shall be recorded in the SAR:

Type of dryer:

- drum dryer;
- belt dryer; or
- other (specify).

Fuel used:

- natural gas;
- industrial gas;
- diesel oil;
- propane;
- waste heat fossil boiler;

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- wood pellets;
- wood residues;
- bark;
- other biomass residues; or
- other (specify).

For every type of fuel used, specify fuel consumption in MJ / metric tonne and in one of these units:

- litres / metric tonne pellet;
- kg / metric tonne pellet; or
- Nm³ / metric tonne pellet.

Energy carrier for the dryer where applicable:

- steam;
- hot water;
- hot air; or
- other (specify).

5.4.2 Either option 1 or option 2 must be used for the drying process, where applicable.

Option 1 – Specify moisture content of feedstock

- Data on the mass share of feedstock to be dried as well as both maximum and weighted average moisture content of Input Groups entering the drying process shall be recorded. A single representative value may be calculated for the average and maximum moisture content for each Input Group entering the production process. The CB should validate the methodology used.
- When measurement of moisture of incoming feedstock is not determined on receipt of feedstock, the moisture content shall be measured and recorded as soon as possible in the production process. For example, in the case of the receipt of logs, moisture should be measured after debarking and processing to chips.
- In the absence of moisture monitoring as specified above, the methodology used and the values recorded shall be justified to the CB, and the justification shall be recorded in the SAR.

Option 2 – Specify energy use of dryer, when applicable

- If a heat meter is installed, calculate how much heat energy from the boiler is provided to the dryer and provide details of the calculation;
- Specify heat consumption in kWh/tonne dried feedstock and the corresponding period for this evaluation.

5.4.3 If the feedstock is submitted to a thermal process other than drying (such as torrefaction or pyrolysis), the process shall be described in the SAR, as well as its energy use using the model of the drying process, as described in 4.3.1.

5.5 Total annual amount of electricity used for production of biomass

5.5.1 The BP shall record the electricity consumed during the Reporting Period, stated as kWh per tonne of biomass output.

5.5.2 The BP shall identify the origin of the electricity used. Power used in biomass production is calculated by the formula:

$$C = G + X + P - E - O$$

where:

- C is the net electricity consumption that shall include all usage resulting from the existence of the biomass production process;
- G is the power that is imported from the grid;
- X is the power from a neighbouring external supplier:
 - where the electricity used by the biomass plant is from an external supplier, the amount used during the Reporting Period shall be based on invoices from the supplier, or continuous measurement;
- P is the net electricity that is internally produced by the BP (net means that power consumption of the power plant auxiliaries is subtracted):
 - In the case of on-site electricity generation, the technology and mode (including whether or not it is CHP) shall be recorded in the SAR;
- E is the share of P that is exported to the grid; and
- O is the excluded power consumption on site of the BP, as used by applications other than the biomass production:
 - Electricity consumption can be excluded if appropriate metering is in place to enable exclusion of non-biomass related consumption from biomass related consumption. However, if such additional meters are not available, a theoretical approach can be used to allocate the power to the different uses;
 - Ancillary facilities (for example, offices, cafeterias, workshops, site lighting, laboratories) can be excluded only where this consumption would have occurred in the absence of biomass production.

5.5.3 In all cases, the BP shall provide full information on power generation and use to the CB, and this shall be reported in the SAR. The meter(s) values used for reporting shall cover not only the biomass production process but also non-biomass related process lines (for example, sawmill or other production facilities).

5.5.4 Where data is not available (such as during the commissioning of plants), estimates from design parameters can be used. The BP shall justify the use of any nominal values to the CB, and this shall be recorded in the SAR.

5.6 Total quantity of Biomass production

5.6.1 The BP shall record the total quantity of biomass leaving the processing plant during the Reporting Period.

5.6.2 The quantity shall be evaluated by one or both of the following methods:

- Monitoring by the BP at the plant gate (weighbridge) and/or at the end of the production chain. If the production amount is based on the quantity of biomass leaving the plant, any significant stock variation between the beginning and end of the production period shall be taken into account. The BP shall justify any changes in stock levels to the CB, and this shall be recorded in the SAR; or
- Invoices to the end-users covering the sales during the period, if the accounting system guarantees that all invoices are taken into consideration. Sales figures and transport documents can be used for verification, and they shall be consistent with the production volume (including adjustments reflecting any stock variation).

Note: It is recommended that both methods are used together, but at least one is required.

6 SECTION C: Energy use for transport of Biomass

6.1 Energy for transport

6.1.1 For BPs, the SAR shall clearly identify the Static Data Identifiers (SDIs) appropriate to the transport data and route described. When multiple transport routes are used during the period of legal ownership (for example where a BP supplies to a range of different ports) these shall be described in the SAR and each shall be illustrated with a map.

6.1.2 For all Legal Owners, the following data shall be reported for transport:

- place of departure;
- place of arrival;
- transportation mode;
- type of vehicle used (i.e. truck, diesel or electric train, river barge, ship);
- type of fuel used (see fossil fuels listed in production section as well as transport section for details); and
- for feedstock: average and maximum travel distance; and
- for biomass: total travel distance.

6.1.3 When transport is organised by pipe or conveyor belt (continuous delivery) from a neighbouring location, its weight should be recorded based on either invoices raised or, preferably, in-line measuring devices. When BPs have a system for direct measurement of the feedstock with a batch metering system, the total recorded feedstock input for each Input Group can be aggregated throughout the Reporting Period. The energy used to transfer secondary feedstock from a sawmill by a conveying system (such as a pipeline or conveyor belt) is considered to be part of normal sawmill operations and does not need to be recorded if the cost of the corresponding energy use is covered by the sawmill.

6.1.4 The following data can be recorded only when actual and verifiable data is available (for example, a bill of lading):

- effective load in metric tonnes per vehicle: in the case of trucks, the weight should be measured by a weighbridge, or equivalent, and recorded in a control system;
- evidence that vehicles are not always returning empty (This information may be used to justify a back-haulage rate.).

6.1.5 If transport fuels are blended with biofuels, the share of biofuel shall be reported.

6.1.6 Delivery records shall include, as a minimum, the supplier's name, type of material, date of delivery and weight.

6.1.7 Fuel consumption of the vehicle (mass or volume per metric tonne and per km) used for transport should be recorded where this will have a significant effect on the GHG balance. In this situation, the

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following approaches can be applied. The data and methodology used shall be justified to the CB, and the methodology and justification shall be recorded in the SAR or SREG, as appropriate.

- Reference fuel consumption can be collected from the transport company including backhaul:
 - for sea vessels it is usually expressed in fuel consumption per day at sea and number of days at sea between both harbours; and
 - for trucks, fuel consumption is usually specified in litre of diesel per 100 km.
- Actual fuel records (tank level and uplifts) for each vehicle or vessel along the relevant travel route can be reported.

6.1.8 The following reference consumption values for trucks, trains and standard types of sea vessels can substitute for recorded data. The MJ base can be obtained from the mass of the relevant fuel used and the standard value for this fuel.

Fossil fuel	LHV	Units
natural gas	37,5156	MJ/Nm ³
diesel oil	35,86	MJ/litre
MFO-RFO	40,500	MJ/kg
propane	45,8	MJ/kg
propane	87,478	MJ/Nm ³
propane	26,656	MJ/litre

Reference transport efficiencies from BioGrace	MJ/t.km
Truck (40 tonne) for chips (and similar size dry product) (Diesel)	0,84
Truck (40 tonne) for pellets (Diesel)	0,87
Ocean bulk carrier (Fuel oil)	0,20
Ocean bulk carrier Panamax (Fuel oil)	0,10
Bulk Carrier "Handysize" - woodchips (Fuel oil)	0,24
Bulk Carrier "Supramax" - woodchips (Fuel oil)	0,15
Bulk Carrier "Supramax" - pellets (Fuel oil)	0,07
Bulk Carrier class "Handy" – PKM	0,13
Local (10 km) pipeline	0,00
Freight train USA (diesel)	0,25
Rail (Electric, MV)	0,21

6.2 Biomass storage, handling and trans-shipment

6.2.1 The Legal Owner shall provide the CB with an annual overview of the quantity of biomass handled at the different storage, handling and trans-shipment locations within the scope of its certification. This should include data on biomass inputs and outputs.

6.2.2 When energy usage data is not readily available for these facilities, conservative, approximated values can be used.

6.2.3 Where energy usage data is available for these facilities, the Legal Owner may report the fuel and power used by the facilities involved.

6.2.4 Values reported shall be supported by evidence such as logbooks.

6.2.5 Reported energy usage shall include sources such as vehicles, fans and conveying, loading or stacking systems. Diesel use is reported in litres/metric tonne biomass, electricity use in kWh/metric tonne biomass.

6.2.6 The Legal Owner shall justify the approach followed and the values used to the CB, and this information shall be recorded in the SAR or SREG, as appropriate.