Netherlands Enterprise Agency

SDE+ sustainability requirements for solid biomass

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The sustainability requirements for the categories *Existing capacity for co-gasification and co-firing, New capacity for co-firing* and *Industrial boiler steam from wood pellets* consist of principles that are described in the criteria. When needed, the principles and criteria are elaborated on in a guidance section. The sustainability requirements apply to the end-user and to the various biomass categories. The sustainability requirements are structured as follows.

1 Requirements placed on the end-user

Only the biomass categories that are listed in Table 1 and meet the requirements described in this table are applied. The end-user must meet the relevant requirements for the Chain of Custody in Chapter 6. With regard to the greenhouse gas balance, the end-user is subject to the following requirement:

P1 The use of biomass must lead to a substantial reduction in greenhouse gas emissions calculated across the entire chain in comparison to the use of fossil fuels.

C1.1 The reduction in CO2eq emissions is calculated to be a minimum of 70% per year on average based on the EU reference value. The average emissions have a maximum of 56g CO2eq/MJ for electricity and 24g CO2eq/MJ for heat. No consignment of biomass shall result in emissions above 74g CO2eq/MJ for electricity and 32 g CO2eq/MJ for heat.

Guidance:
The calculated maximum CO2eq emissions must be based on the most recent European Commission publication on sustainability criteria for solid biomass and the reference values provided for fossil fuels. The Staff Working Document: *State of play on the sustainability of solid and gaseous biomass used for electricity, heating and cooling in the EU (SWD (2014) 259)* states the following reference values for fossil fuels: 186g CO2eq/MJ for electricity and 80g CO2eq/MJ for heat.

2 Biomass categories

There are five biomass categories.

1. ***Woody biomass from large forest management units (500 hectares or more)***
   Branches, tops, trees and primary felling residues sourced directly from forests of 500 ha or larger. Unused wood that has the same composition as wood growing in the forest and that has not been mixed with or contaminated by foreign materials or substances.
2. ***Woody biomass from small forest management units (less than 500 hectares)***
   Branches, tops, trees and primary felling residues sourced directly from forests of less than 500 ha. Unused wood that has the same composition as wood growing in the forest and that has not been mixed with or contaminated by foreign materials or substances.
3. ***Residues from nature and landscape management***
   Biomass residues (branches, tops, trees) produced during the course of managing urban and rural green spaces and nature areas, other than forests designated for the preservation, restoration or enhancement of specific natural, recreational or aesthetic functions. These also include biomass residues produced during routine maintenance of public green spaces and parks.
4. ***Agricultural residues***
   Residues directly from agricultural businesses. Short rotation crops are excluded, with the exception of the residues hereof.
5. ***Biogenic residues and waste flows***
   Waste flows and residues from the agri-food and wood industry (secondary residual waste) and tertiary residual waste such as post consumer wood waste.

For each of the categories requirements concerning sustainability and the Chain of Custody apply in the form of principles and/or criteria that must be met. The sustainability principles and the criteria concern carbon, land use changes, compliance with legislation and sustainable management. Table 1 lists the principles that apply to the recognised biomass categories.

Table 1 **Biomass categories and the corresponding principles**
(n/a means that the principles are irrelevant or that the risks are low)

Principles / **Category**	Carbon and land use changes	Sustainable management criteria	Chain of Custody (CoC)
1. Woody biomass from large forest management units (500 ha or more)	**P 3-5**	**P6-12**	**P13-15**
2. Woody biomass from small forest management units (less than 500 ha)	**P3-4**	**P6-12**	**P13-15**
3. Residues from nature and landscape management	n/a	**P2**	**P13-15**
4. Agricultural residues	n/a		**P13-15**
5. Biogenic residues and waste flows	n/a	n/a	**P13-15**

Temporary exemption from definition of first link in CoC for category 2
The P6-12 principles apply to woody biomass from forests, regardless of the size of the management unit. If the biomass comes from a small forest management unit (< 500 ha, category 2), then the sustainability level can temporarily be demonstrated at the level of a larger cohesive region of which the forest forms a part. In this case, the first link in the chain (the location where the biomass is initially gathered after harvest) will be certified. This is usually the pellet mill. The pellet mill is subject to requirements, such as informing the forest managers about the sustainability requirements and verifying that these are complied with. The relevant procedure can be found in the verification protocol (available separately).

3 Requirements for residues from nature and landscape management and agriculture

P2 Soil quality must be maintained and where possible improved.

C2.1 Best practices are applied for the maintenance or improvement of the soil and soil quality in relation to production or the management objectives as these have been set down in a management plan.

4 Requirements for carbon and land use changes

P3 Production of raw biomass may not result in the destruction of carbon sinks.

C3.1 Biomass is not sourced from permanently drained land that was classified as peatland on 1 January 2008, unless it can be demonstrated that the production and harvesting of the biomass does not result in water depletion of a formerly undrained soil.

C3.2 Biomass is not sourced from land that was converted from a wetland to an alternative, dryer ecosystem after 1 January 2008.

C3.3 Biomass is not sourced from production forests (including wood plantations) that were created by means of conversion of natural or semi-natural forest after 31 December 1997.

P4 The use of biomass may not result in a long-term carbon debt.

C4.1 The forest management unit where the wood is sourced must be managed with the aim of retaining or increasing carbon stocks in the medium or long term.

Guidance:

This can be proved by means of a forest management plan or equivalent documentation. This plan describes the current carbon stocks in the overground vegetation of the forest management unit and the desired development of the carbon stocks. This can also be expressed in terms of tree stand or other carbon stock proxies. The plan pays specific attention to the intended volumes of biomass to be harvested, the influence of harvesting and the replenishment of the carbon stocks in the medium or long term. The length of the term (medium or long) depends, among others, on the type of forest, the growth rate and the forest management system.

C4.2 Biomass is not sourced from stumps unless these stumps had to be removed from the site for other reasons than wood or biomass production.

Guidance:
A reason to remove stumps could be the construction of a road.
The biomass producer (pellet mill) must provide evidence that there is a low risk of rough biomass from stumps being processed.

C4.3 On average less than half the volume of the annual roundwood harvest from forests is processed as biomass for energy generation.

Guidance:
This is calculated by dividing the volume of roundwood supplied to a pellet mill by the total volume of round wood that was harvested in the same year (in the calculation both volumes are excluding wood harvested during thinning).
Roundwood sourced from production forests with harvest rotations of less then 40 years are exempt from this requirement.

P5 Biomass production may not result in Indirect Land Use Change (ILUC).

C5.1 Biomass sourced from new bioenergy plantation systems that were planted after 1 January 2008 must have a demonstrably low ILUC risk.

Guidance:
Small forest management units in category 2 are exempt from this requirement.
ILUC risks must be calculated using the LIIB methodology and requirements (LIIB = Low Indirect Impact Biofuels) or an equivalent method. The methodology shall be evaluated every three years (if there is sufficient cause to do so) and modified to incorporate any improvements.

5 Requirements for sustainable forest management

P6 Relevant international, national, and regional/local legislation and regulations shall be observed.

C6.1 The forest manager holds the legal right to use the forest.

C6.2 The forest manager complies with all obligations to pay taxes and royalties.

Guidance: These obligations do not only concern the logging activities, but also all other financial obligations connected to the management of the forest.

C6.3 All applicable anti-corruption legislation is observed. If no anti-corruption legislation exists, the forest manager must take alternative anti-corruption measures proportionate to the scale and intensity of the management activities and the risk of corruption.

P7 Biodiversity must be maintained and where possible enhanced.

C7.1 Sites with a high conservation value and representative areas of the forest types that are found in the forest management unit have been identified and are protected and where possible enhanced.

Guidance: Examples of sites with a high conservation value are areas with special ecological, archaeological or cultural value.

C7.2 Measures have been taken to protect endangered plant and animal species and, if applicable, to increase the populations and enhance the habitat of these species.

Guidance:
Plants species include species of trees.
An example of habitat enhancement is facilitating nesting in dead trees.
Protected and endangered plant and animal species are not exploited for commercial purposes.

C7.3 The conversion of forests within the forest management unit to other forms of land use, including wood plantations, is not permitted unless:
- it concerns a small area (the total converted area over the years is no greater than 5% of the area of the forest management unit on benchmark date 1 January 2008); and
- it clearly leads to long-term advantages for nature conservation; and
- there is no damage or threat of damage to areas with a high conservation value.

C7.4 In case of wood plantations, there is a preference for native species, and a relevant percentage of the plantation must be able to revert to natural forest at a later stage.

Guidance: A relevant percentage is 5% of the total area.

C7.5 Exploitation of non-wood forest products, including products from hunting and fishing, is regulated, monitored and controlled, among others to safeguard the maintenance of the biodiversity in the forests.

P8 The regulating effect and the quality, health and vitality of the forest must be maintained and where possible enhanced.

C8.1 The soil quality of the forest management unit is maintained and if necessary improved, with special attention to coasts, river banks, erosion sensitive areas and sloping landscapes.

Guidance: Indicators for the prevention of soil erosion are the threshold values for the maximum allowable height and slope.

C8.2 The water balance and quality of both groundwater and surface water in the forest management unit and downstream (outside the forest management unit) must be at least maintained and where necessary improved.

Guidance: The maintenance and, if necessary, improvement of ground and surface water includes the protection and restoration of natural waterways, water bodies, riparian zones and corridors between these.

C8.3 Important ecological cycles present in the forest management unit are preserved, including carbon and nutrient cycles.

Guidance: Examples are groundwater level maintenance in peatlands, water turbidity prevention and measures taken to prevent large-scale leaching of nutrients after harvesting.

C8.4 Unnecessary damage to ecosystems is prevented by applying the most suitable logging (Reduced Impact Logging) and road construction methods and techniques for the local conditions.

C8.5 If fires are used to achieve the forest management objectives (such as regeneration of specific tree species), then adequate control measures have been taken.

C8.6 The forest management measures are designed to prevent and control diseases and plagues where these form a threat to natural capital.

C8.7 The use of chemicals is only permitted if the ecological processes and the optimal deployment of sustainable alternatives prove insufficient. Pesticides classified as type 1A and 1B by the World Health Organisation and chlorinated hydrocarbons are not permitted.

C8.8 The accumulation of inorganic waste and litter is prevented and such waste and litter is collected, stored in the approved areas and disposed of responsibly.

P9 The production capacity for wood products and the relevant non-wood forest products must be maintained in order to safeguard the future of the forests.

C9.1 The production capacity of all forest types represented in the forest management unit is maintained.

Guidance: Overexploitation of separate commercial tree species must be prevented.

C9.2 The forest management unit is sufficiently protected against all forms of illegal exploitation (timber and non-timber forest products including hunting and fishing), illegal establishment of settlements, illegal land use, illegally initiated fires, and other illegal activities.

P10 The management of the forest must contribute to the local economy and create employment opportunities.

C10.1 The management of the forest and local processing of wood and non-wood forest products creates a reasonable amount of employment opportunities for the local population, including indigenous peoples.

Guidance: The creation of employment opportunities for the local population, including indigenous peoples, could be facilitated by offering training.

P11 Sustainable forest management must be achieved through a management system.

C11.1 The forest management system is designed to achieve the objectives of a forest management plan and includes a cycle of inventory and analysis, planning, implementation, monitoring, evaluation and adjustment.

Guidance: The management cycle is implemented with the aim of ensuring continuous improvement of the management system in order to ensure the long-term conservation of the forests. An Environmental Impact Assessment (EIA) will form part of the planning.

C11.2 A forest management plan is drawn up that at least includes:
- a description of the current condition of the forest management unit;
- the long-term goals, including economic, social and ecological functions;
- the average annual allowable cut per forest type and, if applicable, the annual allowable harvest of non-wood forest products based on reliable and current data;
- the budget for the implementation of the forest management plan.

Guidance:
The forest management plan must contain clear descriptions of the ecosystems and species represented and the management goals, including economic, social and ecological functions and aspects. This entails identifying and mapping areas with high ecological values and describing the plans for protecting these.
The plan must be underpinned by a realistic budget.

C11.3 Essential elements for the management of the forest are indicated on maps.

Guidance:
Examples are areas with special ecological, archaeological or cultural values, areas reserved for wildlife and areas where harvesting takes place.

C11.4 The implementation of the forest management plan and the ecological and economic effects thereof are periodically monitored on the basis of reliable data.

Guidance:
Ecological effects include for example changes in flora and fauna and the composition of the forest. Economic effects include for example the creation of employment and products and services that are derived from the forest.

C11.5 The forest management plan is implemented by professional office and field staff. The staffs' expertise and knowledge is maintained by means of an adequate and regular training programme.

P12 If a forest is managed by a group or regional association then there shall be sufficient safeguards for sustainable forest management.

C12.1 A group or regional association is lead and supervised by an independent legal entity.

Guidance: The purpose of the entity is to stipulate the responsibility for the forest management

C12.2 A group or regional association meets the requirements of sustainable forest management. The separate forest management activities of the individual members of the group or regional association shall also meet these requirements if applicable for the management of the forest concerned.

Guidance: A description must be provided of the status of the forest in the relevant region and it must be demonstrated that the carbon stocks will be maintained or increased.

6 Requirements for the Chain of Custody

P13 A Chain of Custody (CoC) must be in place that covers the entire chain from the first link to the bioenergy producer. This CoC shall link the source to the material used in the product or product group, and quantify the greenhouse gas emissions of each individual link (operator).

Guidance:
There are five biomass categories (see Table 1). Each category comes from a different source (see table below).

Table 2 Distinction between the source and the first link in the CoC per biomass category

Category	Source	First link (potential first CoC certificate holder)
1. Woody biomass from large forest management units	Forest management unit > 500 ha	Forest management unit
2. Woody biomass from small forest management units	Forest management unit, or predefined collection area of which the forest management unit of < 500 ha forms a part.[1]	Forest management unit or first gathering point[2] Biomass producer (BP) (Pellet mill)
3. Residues from nature and landscape management	Predefined collection area	First gathering point
4. Agricultural residues	Predefined collection area	First gathering point
5. Biogenic residues and waste flows	Company that generates the residual product	First gathering point

C13.1 Each individual organisation in the Chain of Custody uses a CoC system that meets the relevant requirements of this standard.

C13.2 Each individual organisation in the Chain of Custody has the relevant greenhouse gas emissions information for its own organisation, which has been obtained using a methodology that is based on the most recent European Commission publication on sustainability criteria for solid biomass and the reference values provided for fossil fuels.

Guidance: This is currently the Staff Working Document, SWD (2014) 259. (*See P1 for more information.)*

C13.3 The management system of each organisation in the CoC provides safeguards that ensure that these CoC requirements are met.

Guidance: If an organisation wishes to apply a certificate to a subcontractor, then it must ensure that this subcontractor only uses the certification system labels for the products described in the subcontracting agreement.

C13.4 Each individual organisation in the Chain of Custody registers the quantities and the names and certificate numbers of the organisations they purchase biomass from and sell biomass to.

C13.5 Businesses keep all documentary evidence available for a minimum of 5 years.

[1] A temporary exception applies for the first link for small forest management units. See Chapter 2 for an explanation and an overview of the requirements for the biomass categories.

[2] The first collection point is the first legal owner of the material after the business from which the biomass was sourced.

C13.6 Mixing of materials from categories 1 an 2 with different sustainability characteristics is only permitted if at least 70% of the mixture used by the end-user complies with all the relevant principles and the corresponding criteria in Table 1, and the remaining 30%:
- complies with P3, P4 and P5; and
- is not sourced from converted forests as described in C7.3; and
- is not sourced from forests where high conservation values are threatened as described in C7.1.

C13.7 If materials with different sustainability or other characteristics are mixed anywhere in the chain, one or both of the following methods must be applied:

Volume credit method:
The registered characteristics and quantities of the biomass output are the same as the characteristics and quantities of the corresponding biomass input after application of the conversion factor.

Percentage based method
The percentage of material in a product or product group that meets the relevant principles and the corresponding criteria in Table 1 is reported.

For both methods:
- the method may be applied up to the level of a location; and
- the organisation defines a claim period during which the biomass input is measured and reports the results; and
- the sustainability characteristics (including categories and quantities) of mixed biomass output must be able to be traced back to the characteristics of the individual biomass inputs, taking account of the applicable conversion factors.

Guidance:
The sustainability properties do not only concern sustainable management of the source, but also the relevant greenhouse gas emission data, which have been obtained using a methodology that is based on the most recent European Commission publication on sustainability criteria for solid biomass and the reference values provided for fossil fuels. The percentage-based method may only be applied for forest-based biomass.

P14 In case of a group management system of the CoC the group as a whole shall meet the same requirements for the CoC as individual businesses. The management system must meet a number of requirements to this end.

C14.1 A group is led by a legal entity who is responsible for the group as a whole. This entity uses a management system that enables it to effectively supervise the participating locations within the scope of the system.

Guidance:
The entity has an effective management system in place as well as the appropriate technical and human resources.
The entity conducts an annual audit of a sample of the members (using a prearranged random sample method).

C14.2 The group applies a CoC system and the corresponding criteria as described in P13. Furthermore, each group member individually meets these requirements insofar applicable to their own activities.

C14.3 The group leader uses a registration system to record:
- the names and addresses of the members;
- a declaration submitted by each member in which they declare that they meet the CoC certification requirements;
- the incoming and outgoing biomass flows of each individual group member.

P15 The logos and labels of a certification system that are printed on products and documents must be unambiguous and must be used in accordance with the rules of that certification system. The following requirements apply to the certification system:

C15.1 The system manager applies rules for the use of logos and labels and ensures these rules are adhered to. The rules include at least:
descriptions of the logos and labels;

- unambiguous descriptions of the claims represented by the logos and labels, including the requirement to report actual percentages or minimum percentages of certified, recycled material that is used in the product or product group;
- licenses to use the logos and labels;
- instructions pertaining to the use of the logos and labels and the information printed on them.

C15.2 The logo is copyrighted and registered as a trademark.

C15.3 There is a clearly described mechanism for checking all claims made with regard to the certified properties of the products. This mechanism shall ensure that claims are clear and accurate and that action is taken to prevent incorrect or misleading claims.

7 Definitions

(Timber) harvest The volume (including bark) of all trees, living or dead, with a diameter of more than 10cm at breast height, that is harvested annually in a forest or forested area. This includes all harvested trees, regardless of whether they are removed from the area or not. Used as a reference for the carbon debt criterion. (JRC)

Annual Allowable Cut (AAC) The volume of wood that is allowed to be annually harvested within a predefined area, normally expressed in cubic metres of wood per year. The calculation of the AAC must take account of landscape values, forest types, protected areas and infrastructure and it may not exceed the net annual afforestation in the long term. (TPAS)

Biodiversity The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. (TPAS)

Branch A sprout of a stem or trunk or a secondary trunk or stem that branches off the main trunk or stem. Used as a reference for the carbon debt criterion. (JRC)

Chain of Custody A set of rules, procedures and documents (on company level) that are used to provide a link between the source of a material and the point in the chain where a claim is made on the characteristics of that material. (ISO 13065:2015, 3.7)

Chemicals Substances that are potentially hazardous to health or the environment or that could potentially cause material damage (NTA8080).

Consignment A quantity of biomass that is used for energy production and that has uniform physical and sustainability characteristics. A consignment may consist of several truckloads or shiploads, as long as the characteristics of the biomass are uniform. The mass balance requirements do not prohibit mixing of similar materials, and hence a single physical delivery could also involve several different consignments. E.g. a shipload of wood from the US and Canada could comprise 2 separate consignments of biomass.)

Conversion (of natural forest) Human activity that results in the conversion of a natural forest into another form of land use. (TPAS)
Ecological cycles Natural processes whereby elements that occur in various forms are continually exchanged between the various compartments of the ecosystem, including the nutrient, carbon and aquatic cycles. (TPAS)

Ecological functions The ecological functions that the forest fulfils, including climate regulation, erosion control, soil formation, water retention, carbon storage, water purification, pollination and maintenance and development of the existing biodiversity.

Endangered species Plant and animal species that are at least classified as 'endangered' in the international Red List of the IUCN and in the IUCN's guidelines for the regional application of the Red List. (TPAS)

Forest Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban use. Used as a reference for the carbon debt criterion. (FAO)

Forest management Planning and executing activities aimed at the management and use of forests and other forested areas in order to achieve predefined economic and/or social and/or cultural and/or environmental goals. (TPAS)

Forest management unit One or more forest stands containing natural forest, planted forest or another types of forest that is managed as a single unit.

Forest manager The owner, concessionaire or person who in some capacity or other is responsible for the management and exploitation of a forest management unit. (TPAS)

Group or regional association Legal entity involving several forestry companies who cooperate in a certain area, or companies that work together in a certain segment of the Chain of Custody. (TPAS)

Habitat An area or type of area where an organism or population occurs naturally.
Legal right to use (of the forest manager) The right, granted by a government authority, to carry out forestry activities in a certain area. (TPAS)

Natural forest Forest that has a natural origin and is developed naturally without the intervention of man.

New bioenergy plantation system A plantation system that is specifically developed for the production of biomass for energy generation, whereby rapidly growing tree species (e.g. willow, poplar, eucalyptus and acacia) are planted in dense plantations and harvested in short rotation periods. These systems include: (i) Short Rotation Coppicing systems, whereby the new crop grows from the stumps of the previous harvest, with rotations of between 2 and 10 years and (ii) short rotation forestry plantations using tree species that can be harvested within 20 years or less.

Non-wood forest products All forest products other than wood, including materials harvested from trees such as sap and leaves, and other plant, animal or plant-animal products. (TPAS)

Peatlands Areas with soils containing at least a 40cm deep layer of peaty material in the first 80cm of the soil.

Production forest A forested area primarily intended for the production of wood, fibre, bioenergy and/or non-wood forest products.

Reduced Impact Logging (RIL) Harvesting techniques and methods developed to prevent unnecessary damage to the forest, environment and the wood itself, as well as creating safer working conditions for the foresters.

Residues (primary, secondary or tertiary) Primary residues are biomass that is processed directly on the logging site (e.g. logs, wood chips, pellets and harvest residues). Secondary residues are residual products from wood processing (sawdust, bark etc.). Tertiary residues are post-consumer residues.

Rotation period Clearcutting: the period between planting and the final cut. Selective logging: the period between two harvests. The period between two harvests is also called the cutting cycle (this is about 30 years in the tropics).

RoundwoodUnprocessed wood from a tree trunk excluding branches, stump and roots. Used as a reference for the carbon debt criterion.

Selective logging Logging method used in unevenly aged and usually mixed stands of forest from which trees are harvested periodically, whereby the forest as a whole remains standing indefinitely (i.e. no clearcutting takes place).

Semi-natural forest A forest in which natural processes have an important influence on the development of the forest (even if the forest was originally planted).

Stump The part of the tree that remains attached to the roots after felling. Used as a reference for the carbon debt criterion. (JRC)

Sustainable forest management The management and use of forests and other forested areas in a manner and with an intensity that ensures that they retain their productivity, biological diversity, regeneration capacity and vitality, as well as the capacity to fulfil the relevant economic, ecological and social functions now and in the future at the local, national and global level, whereby carbon stocks are maintained or increased over the long term and no damage is caused to other ecosystems. (TPAS)

System manager Legal representative of the certification system. (TPAS)

Thinning The selective or systematic harvesting of trees from a more or less uniformly aged forest with the aim of increasing the trunk diameter and health of the remaining stand of trees.

Thinnings Wood obtained from trees harvested as part of thinning activities.

Wetlands Land that is permanently or semi-permanently covered or saturated with water. Used as a reference for the carbon debt criterion. (EU-RED)

Wood plantation Forest consisting of uniformly aged trees of a single or a few species, usually exotics, planted or sown in a uniform pattern, with the aim of producing wood products.

Source: Staatscourant, nr. 10750: Wijziging algemene uitvoeringsregeling SDE 26-02-2016 (Government Gazette, nr. 10750 - Dutch)

Stimulation of Sustainable Energy Production (SDE+)
With SDE+ the ministry of Economic Affairs aims to encourage the production of renewable energy in the Netherlands. Renewable energy is better for the environment, makes the Netherlands less dependent on fossil fuels and is beneficial to the economy.