

About Nordic Swan Ecolabelled Solid fuels, and fire lighting products



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1 Justification of the product group definition

For a description of the product group definition, see “What can carry the Nordic Swan Ecolabel”.

Further background for the product group definition:

Pellets, briquettes, wood chips and firewood: The definition of pellets, briquettes, wood chips and firewood is consistent with EN ISO 17225 part 1-5:2021 (solid biofuels). This standard determines the fuel quality classes and specifications for solid biofuels for general use. The classification principle of the solid biofuels is based on origin and source, major traded forms (briquettes, pellets, wood chips, sawdust, firewood, straw, miscanthus (elephant grass), reed canary bales, grains, olive residues, etc.) and properties of solid biofuels. The classification system is flexible. A hierarchical classification system includes four sub-groups: woody biomass, herbaceous biomass, fruit biomass and biomass blends and mixtures. The standard involves special requirements for chemically treated biomass (other than heat, air or water). EN ISO 17225:2021 consists of the following parts: Part 1: General requirements, Part 2: Graded wood pellets, Part 3: Graded wood briquettes, Part 4: Graded wood chips, Part 5: Graded firewood, Part 6: Graded non-woody pellets, Part 7: Graded non-woody briquettes.

Barbecue charcoal and briquettes: The requirement for the definition of barbecue charcoal and briquettes is consistent with the general definition in EN 1860-2:2023.

Fire lighting products: The requirement for fire lighting products is consistent with the general definition of solid and thickened liquid fire lighting products in compliance with the definition in EN 1860-3:2023.

There are also solid fuel types on the market that combine the features of the above product types (e.g. products that serve as both a solid fuel and a fire lighting product). Typical for these product types is that they consist of a combustible solid material to which a lighter fluid/material has been added or that they are packaged inside paper or plastic for use as fire lighting material. As there is no specific quality standard for this product type, these products must demonstrate that they comply with all the Nordic Ecolabel's requirements within the different product types that the product has combined.

A considerable amount of the material in solid fuels is renewable, but they can also contain inorganic and organic fossil materials as fillers or additives. Nordic Ecolabelling works to achieve a greater use of renewable raw materials for those product areas where this makes sense.

Nordic Ecolabelling of products based on renewable raw materials will thus be able to help consumers and businesses to choose solid fuels with minimal impact on the environment. Small amounts of additives, fillers or chemicals from non-renewable sources or recycled material may be necessary, however, and a requirement for all products to consist of 100% renewable materials is therefore not possible.

To achieve a clear definition of the product group, only solid fuels are included in the product definition. Liquid fuels for transport, heating and industrial production therefore may not be Nordic Ecolabelled according to these criteria but may be Nordic Ecolabelled according to

the criteria for biofuels. Liquid fire lighting products, defined by the EN 1860-3 2023 standard, are not included in the product group, as they are not considered solid fuels. The steerability (S) on liquid fire lighting products is low as these products also can be used as primary fuels for example bio-fireplaces and oil lamps. Nor does the product group include matches, as the purpose of matches is to emit thermal energy for a very short period to ignite the actual fire lighting products. Smoking wood chips may not be Nordic Ecolabelled according to these criteria. The purpose of smoking wood chips is to generate smoke and thus transfer flavour to the food. Smoke carries emissions that are harmful to health, such as particulate matter, OGC, CO, VOC and NOx in the use phase.

Barbecue charcoal and briquettes may be impregnated with lighter fluid (which is usually fossil) for easy lighting. This is typical, for example, for the charcoal in disposable barbecue grills. In the view of Nordic Ecolabelling, barbecue products should be free from impurities and additives, which can bring unwanted smoke and flavours to the food on the barbecue. A report¹ by The Danish Veterinary and Food Administration (DVFA) concludes that there is a risk that the shorter the distance between the food and the source of heat, the greater the amount of carcinogenic PAH compounds. The rack on a disposable barbecue grill is very close to the charcoal. The product also contains several materials (metal rack and tray) that are not solid fuels. For this reason, disposable barbecue grills may not be Nordic Ecolabelled according to these criteria.

2 Summary

The overall aim of this revision is to ensure that the Nordic Ecolabel's criteria continue to secure a positive environmental benefit via ecolabelling and that the criteria are viable and clear for the industry. The revision has mainly focused on updating and expanding the energy requirements, strengthen the control and traceability of barbecue charcoal and briquettes, updating the chemical requirements with new classifications from ECHA and updating all standards and methods referred to in the criteria.

To obtain an overview of the key environmental impacts in the products' life cycles, an environmental assessment of the product group was performed as a qualitative MECO analysis for each of the four product areas. MECO stands for the assessment of Materials, Energy, Chemicals and Other characteristics and describes the principal environmental impacts during the product group's life cycle phases. This was followed by an overall RPS (Relevance-Potential-Steerability) analysis for the product group.

High RPS was found for the following:

- Raw materials contained in solid fuels and fire lighting products,
- Energy consumption and impact on the climate.
- The quality of the solid fuels and fire lighting products.

The main changes in the revised version based on the assessment are:

¹ The Danish Veterinary and Food Administration (DVFA): Final report on PAH in smoked meat and fish and grilled meat, November 2015

- Tightening and updating the requirements for annual audit of barbeque charcoal and briquette production sites.
- Country of origin must be specified on the packaging.
- Introducing possibility of test of tree species in barbeque charcoal and briquettes when there is suspicion of false claims.
- Introducing energy requirements for the production of firewood.
- Lowering the threshold value for the use of fossil fuels from 10% to 3% of the total yearly energy consumption.
- Updating the chemical requirements with new classifications according to CLP Regulation².
- Updating all standards and methods referred to in the criteria.

2.1 Changes compared to previous generation

Here, the most important changes compared to the previous generation are briefly listed.

Figure 1 Overview of changes to criteria for Solid fuels and firefighting products generation 3 compared with previous generation 4.

Requirement generation 3	Proposed requirement generation 4	Same requirement	Change	New requirement	Comments
O1	O1	X			-
O2	O2		X		Standards are updated to newest version.
O3	O3	X			Wording is updated but requirement level is unchanged
O4	O4		X		Level of certified wood in pellets is updated from 50% to 70%.
O5	O5	X			-
O6	O6	X			-
O7	IR				Requirement removed. Paper pulp and fluff is documented as other wood materials.
O8	O7	X			-
O9	O8		X		Updated with new chemical classifications of chemical products. Safety data sheet must be handed in as part of the documentation. Threshold limit for contaminations is updated to 1000 ppm.
O10	O9		X		Updated with new chemical classifications for ingoing substances.
O11	O10		X		Share of fossil fuels for start-up is lowered from 10% to 3% on an annual basis. The amount of fossil fuel used must be documented by measurements, invoices or similar.
O12	O11		X		Energy requirement is introduced for drying of firewood.
O13	O12		X		Standards are updated to newest version.

² Classification, labelling and packaging of chemical substances and mixtures placed on the EU market.

O14	O13		X		Alternative method for cme assurance of moisture is introduced (insertion of moisture meter).
O15	O14	X			-
O16	O15		X		Annual inspection is removed from requirement and a separate requirement is made in O20
O17	O16	X			-
O18	O17		X		Standards are updated to newest version.
O19	O18		X		Additional information to consumers: Country of production site and Country of origin of the wood raw material
O20	O19	X			-
IR	O20			X	Detailed specification of content of yearly audit of barbeque charcoal and barbeque charcoal briquettes production sites. Introduction of competence requirement for auditor.
IR	O21			X	Possibility sampling of barbeque charcoal to determine tree species, based on suspicion of false claims.
IR	O22			X	New requirement regarding customer complaints.
O21	IR				Removed
O22	IR				Removed
O23	IR				Removed
O24	IR				Removed
O25	IR				Removed
O26	O23		X		New requirement text regarding traceability.
O27	IR				Removed

3 Justification of the requirements

3.1 Production and product description

Background to O1 Description of the product

The intention of the requirement is to provide an adequate picture of the life cycle of the product and any packaging: what raw materials and production processes are used, what binders or additives are used, and so on. The requirement will thus give an insight into the product(s) in the application to ensure the application is processed correctly.

3.2 Resources

Background to O2 Material composition

The requirement for product definition, classification and types of raw materials in pellets, wood briquettes, firewood, wood chips and barbecue charcoal/briquettes are consistent with EN ISO 17225 part 1-5:2021³. The standards have been updated since the previous generation 3 of these criteria which referred to EN ISO 17225 part 1-5:2014.

Regarding product definitions, they are not changed in the updated standards.

Regarding class and types of raw material the updated standards has only been updated regarding wood briquettes. This requirement has been updated in line with the standard, which means that also the category 1.1 Forest, plantation and other virgin wood are allowed in wood briquettes. However, this criteria document restricts further the type of raw material through other requirements. The requirement to wood raw material stipulates that at least 95% of raw material in pellets/wood briquettes must consist of residues.

Barbecue charcoal/briquettes and fire lighting products are not covered by EN ISO 17225:2021 itself but Nordic Ecolabelling believes that it is appropriate that these too should meet the defined requirements for raw materials in the standard.

The requirement that the wood raw materials in pellets, wood briquettes, firewood and wood chips must be class A1 (class A2 is also allowed for wood chips and firewood) ensures, that only pure raw materials from stem wood with or without bark and chemically untreated residual products from forestry industries are used in the products. The reason for requiring class A1/A2 raw materials is to ensure a high quality of pellets, briquettes and wood chips and firewood, which is required particularly in small and medium-sized boilers to ensure a clean and efficient combustion.

Both the EN ISO 17225 part 2 and 3 and the ENplus standard⁴ operate with 3 quality classes (A1, A2 and B), with class A1 permitting use of the “purest” raw materials. The ENplus standard largely corresponds to EN ISO 17225-2 and 3 for pellets and briquettes, except that ENplus does not allow the use of demolition wood and chemically treated wood⁵. Nordic Ecolabelling has chosen to not include labelling of non woody pellets and briquettes (according to EN ISO 17225 Part 6 and 7) in this criteria generation. This is because these types of products are only used in a very limited extent in the Nordic market, and that they do not meet the same quality standards as for wood pellets and wood briquettes. If Nordic Ecolabelling receives a specific interest in including non-woody pellets/-briquettes in the product group, Nordic Ecolabelling will look favourably to do so.

Raw materials for barbecue charcoal/briquettes must derive from stem wood, residual products from forest industries or stone/kernel fruits similarly to ensure that only pure raw materials are used in the products. Requirements for types of raw materials are consistent with EN ISO 17225 part 1:2021. Barbecue charcoal/briquettes are primarily made of wood. However, there are also barbecue briquettes on the market whose raw material is coir fibre (by-product of the coconut milk industry). The Nordic Ecolabel wishes to make it possible for barbecue charcoal/briquettes produced using fibrous materials from stone/kernel fruits to be Nordic Ecolabelled.

³ EN ISO 17225-1 Solid biofuels – Fuel specifications and classes, Part 1: General requirements, Part 2: Graded wood pellets, Part 3: Graded wood briquettes, Part 4: Graded wood chips, Part 5: Graded firewood.

⁴ The European pellet industry's own quality standard for pellets/briquettes - <http://www.enplus-pellets.eu>

⁵ ENplus accepts wood that has been treated with wood preservatives against insect attack, which does not classify as chemically treated wood.

There is wide variation in the use of raw materials for fire lighting products, which is why the Nordic Ecolabel also permits, in addition to pure virgin wood, the use of fibre and fruit materials from agriculture and horticulture. Requirements for types of raw materials are consistent with EN ISO 17225 part 1:2021.

Liquid oil is not covered by EN ISO 17225:2021. Renewable raw materials in oils used in fire lighting products therefore have their own definition which, for example, permits raw materials with vegetable and animal origins.

Type of raw material: 1.2.1 According to EN ISO 17225-2:2021, chemically untreated wood residues may contain negligible amounts of glue, grease and other additives used in sawmills during production of timber and timber products from virgin wood. The Nordic Ecolabel wishes to set requirements for the use of pure raw materials to ensure clean combustion. The requirement limits for impurities/additives for the individual product types are stipulated in O13-O15 and O17 requirement specifications.

3.2.1 Wood

Background to O3 Prohibited and restricted tree species

Several tree species are restricted or not permitted for use in Nordic Swan Ecolabel products. Many of the restricted tree species are grown in countries which still have large areas of Intact Forest Landscape (IFLs). These are important to protect due to biodiversity and climate. A lot of these countries also have a high risk of corruption and the national legislation related to environment, human rights and ownership to land are weak and/or not controlled by the authorities. Applying a precautionary approach, the use of listed restricted tree species must comply with strict requirements on origin, traceability and certification.

The list of prohibited species contains species on the CITES list while the list of restricted species contains species on the IUCN red list (categorized as critically endangered (CR), endangered (EM) and vulnerable (VU)), Rainforest Foundation Norway list and Siberian Larch (originated outside the EU). Restricted species can be used in Nordic Swan Ecolabelled products if certain strict conditions on origin, certification and traceability are met.

The requirement only applies to virgin wood and not wood defined as recycled material in accordance with ISO 14021. For more information about Nordic Swan Ecolabelling's approach on forest, click [here](#).

Background to O4 Wood raw material

Nordic Ecolabelling's requirements concerning raw material based on wood, bamboo or cork focus on sustainable forestry and traceability of raw materials.

The many benefits that sustainably managed forests deliver to society include wood for materials and energy, protection against global warming, homes and livelihoods for local communities and indigenous peoples, support of biodiversity and protection of water and soil from pollution and erosion. By setting a requirement that wood raw material must originate from certified, sustainable managed forests, Nordic Ecolabelling is supporting the move towards more sustainable forestry practices.

Depending on the product Nordic Ecolabelling requires that the applicant/manufacturer/supplier is Chain of Custody certified by the FSC/PEFCs schemes. The requirement for Chain of Custody certification contributes to traceability in the supply chain within the FSC and PEFCs guidance and control systems for traceability.

Applicants must document that the specified percentage of all wood raw material (virgin/recycled material) used in the Nordic Ecolabelled product/production line comes from forestry certified under the FSC or PEFC schemes or is recycled material. The remaining proportion of wood must meet the requirements of FSC controlled wood or PEFC controlled sources or be recycled. When the requirement limit is, a minimum of 70% of all wood raw material (virgin or recycled), it corresponds to the FSC and PEFCs requirement limits for use of the respective labels on products, such as "FSC Mix" and "PEFC certified". Recycled materials not covered by FSC/PEFC's Chain of Custody certification, can also be used in the Nordic Swan Ecolabelled products. The requirement must be documented as purchased amount of wood annually.

Residual products from sawmills are the primary type of raw material used in the production of pellets and briquettes in the Nordic countries. However, imported pellets from round wood/solid wood can occur. Nordic Ecolabelling therefore requires that a maximum of 5% round wood/solid wood (defined as 1.1.3 stem wood, according to EN ISO 17225-1) must be used annually in the production of Nordic Swan Ecolabelled pellets/briquettes.

3.2.2 Solid and liquid renewable raw materials other than wood in barbecue charcoal/briquettes and fire lighting products and the tree species (salix/poplar/hybrid asp) grown as energy forest on arable land

Background to O5 Renewable raw materials from soy- and palm oil, palm kernel oil and their derivatives and sugar cane

Palm oil is the primary vegetable raw material used in the production of fatty acid, methyl ester, stearin or oil for fire lighting products as an alternative to paraffin. Soy oil can also be used as an alternative to paraffin. Sugar cane can be used to produce bioethanol. The cultivation of oil palm, soy and sugar cane is associated with several environmental and social problems.

Issues surrounding the production of palm oil:

As the consumption of vegetable oils has increased over the last 30 years, the cultivation of vegetable oil crops has increased faster than any other industrial crop during the last forty years⁶. The total area of oil palm plantations has since 1990 increased by almost 10 million hectares. The largest increases occurred in Malaysia and Indonesia. Palm oil may be separated in several different oils with different characteristics. Palm oil is used in products like cooking oils, margarine, liquid detergents, soaps, cosmetics, waxes and polishes and for livestock feed.

In the early 1970s there was a drastic expansion of palm oil plantations in Malaysia and Indonesia. In 2000 the two countries accounted for just over half of the world's palm oil plantations, while Nigeria accounted for 30% of world production of palm oil.

⁶ RSPO 2012. Promoting The Growth And Use Of Sustainable Palm Oil - Factsheet.

The greatest environmental problem linked to the production of palm oil is the conversion of natural areas into palm oil plantations, as the erosion of natural habitats poses a critical threat to many endangered species. In addition, there may be environmental problems associated with the use of toxins in production, air pollution from burning forests, soil erosion and heavy sedimentation to rivers and streams, as well as discharge of wastewater from palm oil mills.

Large-scale palm oil production creates in addition to the natural and environmental problems also social problems in Southeast Asia. In the production there are risks of violations of labour rights, where the use of chemical and pesticide constitutes a health risk for plantation workers⁷. High unemployment in Indonesia and illegal work in Malaysia increases the risk of wages below the minimum wage, poor response to requests to participate in trade unions and unsafe working conditions. The expansion of palm oil plantations is also helping to displace locals. As a result of many disagreements about ownership of the land the plantation company is the most conflict-prone land-based sector in Indonesia and Malaysia.

Issues surrounding the production of soy:

The intensive production of soy in e.g. Argentina and Brazil has different environmental and natural consequences. Agricultural production of soy and exports from Argentina and Brazil affect the environment on both a local and global level. By deforestation, draining of wetlands and the establishment of monocultures such as soybean fields, increases the risk of loss of biodiversity and habitat fragmentation. Worldwide over the last three decades there has in average been cleared about 13 million hectares of forest a year. When clearing forest, you remove ecosystems, and conversion of natural areas for cultivation can separate the natural habitats of large area. Lack of pathways between natural habitats reduces the genetic flow between populations and increases the risk of species or their food resources to disappear.

The environmental and natural consequences are associated with conversion of natural or semi-natural areas to cultivation areas together with a specialization of culturing methods and use of pesticides.

The extent of pesticide use in e.g. Argentina is so widespread in the soy production, that many Argentinians daily gets in to contact with toxins⁸. In addition to farmers and farm workers who handle sprays, are also locals who live near the soya fields.

Issues surrounding the production of sugar cane:

Sugarcane is per today not attached so strongly to problems with the deforestation of rainforest as mentioned above for palm oil and soybean oil, but there may also be challenges associated with this production. In the period 1960 - 2008 the areal of grown sugarcane has increased from 1.4 to 9 Mha. Approximately 65% of newly planted sugar cane takes place on plains (grasslands and savannahs) and the remainder area is made up of areas previously used for growing other crops. However, with an increase in demand for sugar cane as a feedstock, the possibility of expansion of production areas is explored.

⁷ OLSEN LJ, FENGER NA & GRAVERSEN J 2011a. Palmeolie - Danmarks rolle i forhold til den globale produktion af palmeolie. WWF Verdensnaturfonden Denmark.

⁸ Hermansen J. et al: Soja og Palmeolie, certificeringsordninger til dokumentation af bæredygtighed i produktionen, DCA rapport nr. 029, marts 2013

Therefore, the loss of biodiversity in the rainforest (related to cultivation of sugar cane) can become a problem in the future. Today it is the Cerrado which is under the greatest pressure from the sugar cane industry. The Cerrado is a tropical savanna in Brazil and has a unique biodiversity and specific ecosystems that are threatened⁹.

An expert group in Nordic Ecolabel has explored the standard for palm oil (Round Table on Sustainable Palm Oil, RSPO¹⁰), soybean (Round Table on Responsible Soy Association, RTRS¹¹) and sugar cane (Bonsucro¹²) in details. The conclusion for all three standards is that they currently do not meet the Nordic Ecolabel requirements for raw material certification schemes. This is mainly due to lack of absolute requirements for the protection of important biological areas, and lack of requirements and compliance with basic international conventions. This means that renewable raw materials from palm oil and soybean oil and sugar cane must not be used in Nordic Swan Ecolabelled charcoal/-briquettes and fire lighting products.

Background to O6 Traceability and verification of renewable raw materials in barbecue charcoal/briquettes and fire lighting products and the tree species (salix/poplar/hybrid asp) grown as energy forest on arable land

Since the use of land is, also a relevant environmental parameter in this product group, requirements are set concerning the areas from which the renewable raw materials originate. The aim is to ensure that areas of high biological or social value are not used for cultivation. For Nordic Swan Ecolabelled charcoal/briquettes or fire lighting products made from renewable raw materials, it is therefore important to set requirements concerning the areas from which the raw materials are sourced. Most criteria documents do this by ensuring the origin of the raw material.

A need for traceability is the basis for all vegetable raw material requirements. Traceability tells us where the raw material comes from and who produced it. For many years, Nordic Ecolabelling has made traceability a requirement in criteria that include wood raw materials.

These criteria also set requirements for the traceability of vegetable raw materials, in the same way as the criteria for the Nordic Swan Ecolabelling of liquid fuels. There must be a written policy in place for the purchase of raw materials to also ensure that all raw materials come from legal sources. The criteria therefore contain requirements that renewable raw materials must not be sourced from:

- protected areas or areas under preparation as protected areas
- areas where ownership or usage rights are unclear
- illegally harvested crops

If the renewable raw material can be defined as a waste or residue, there must be traceability to the process from which the waste or residue derived by means of invoices.

⁹ http://www.wwf.dk/wwfs_arbejde/skov/soja/skovomrader/cerrado/ (besøgt 10. december 2017)

¹⁰ <http://www.rspo.org/>

¹¹ <http://www.responsiblesoy.org/en/>

¹² <http://bonsucro.com/>

Vegetable raw materials for barbecue charcoal/briquettes or fire lighting products may, for example, be herbaceous biomass from agriculture and horticulture or fibrous material from coconuts.

FSC and PEFC do not consider energy forest grown on arable land as forest, and therefore this form of cultivation is not covered by these standards. Typically, fast-growing tree species are salix/poplar and hybrid aspen, which are grown as so-called coppice with short rotation. The tree species (salix/poplar/hybrid asp) grown as energy forest on arable land are covered by this requirement.

3.2.3 Requirements for working conditions in the production of barbecue charcoal/briquettes

Background to O7 Working conditions

The requirement for working conditions is the same as in generation 3. Nordic Ecolabelling wishes to make sure that the production of charcoal/briquettes is done in an environmentally and socially sustainable manner. Production of barbecue charcoal and briquettes occurs widely in Asia and Africa¹³ under very poor working and health conditions. The charcoal is often produced under primitive conditions, with huge environmental and human consequences¹⁴.

Nordic Ecolabelling has good experience in setting requirements for compliance with the relevant UN and ILO conventions in other criteria documents, such as criteria for office equipment, PCs and biofuels. The licensee must have a written procedure (Code of Conduct) showing how the license works to ensure that the relevant requirements in UN Conventions are complied with by all producers/suppliers of barbecue charcoal and briquettes in the supply chain. This procedure (Code of Conduct) must also be communicated to all producers/suppliers of barbecue charcoal and briquettes in the supply chain.

The requirement follows the UN Global Compact¹⁵, which aims to create international principles on human rights, labour, environment and corruption. UN Global Compact consists of 10 overall principles and includes requirements for i.e. compliance with the 8 ILO conventions. In addition to the UN Global Compact, the procedure must also include requirements to meet the UN Children's Convention (Article 32) and the UN Convention (61/295) concerning people's rights.

Nordic Ecolabelling appreciates that it may be very difficult to ensure that the working environment at all sub-contractors in all parts of the computer production chain is satisfactory. Nevertheless, Nordic Ecolabelling is confident that the more production facilities and raw material suppliers are confronted with a requirement/signal from their customers that a code of conduct must be met, the more the possibility that such conditions in fact will be improved.

¹³ www.tft-earth.org (2016-11-15)

¹⁴ FERN report (august 2015): "Playing with fire – Human misery, environmental destruction and summer BBQ's"

¹⁵ <http://www.unglobalcompact.org>

In the consultation of generation 3, it emerged that several producers of charcoal/wood briquettes in Asia is certified by BSCI (The Business Social Compliance Initiative¹⁶). Members of the BSCI are required to incorporate a Code of Conduct, which consists of 11 principles they continually need to work to live. The principles are also based on compliance with relevant UN and ILO conventions. Nordic Ecolabelling estimates that BSCI scheme is not yet sufficiently widespread among manufacturers of charcoal/wood briquettes to require certification under this scheme. Companies certified by BSCI may use this as part of the documentation for the requirement.

3.3 Chemicals

Background to O8 Classification of chemical products used in the production

Nordic Ecolabelling aims to minimize the health and environmental impact of chemical products. Therefore, products with the following classifications cannot be used in the Nordic Swan ecolabelled product: Hazardous to the aquatic environment, hazardous to the ozone layer, very toxic, toxic, causes damage to organs, sensitizing, carcinogenic, mutagenic, toxic for reproduction, endocrine disruptive, and persistent, bio accumulative/mobile and toxic.

The updated CLP classifications now include endocrine disruptors, PBT/vPvB and PMT/vPvM substances, covering environmental toxicity, persistence, mobility and bioaccumulation. Including PMT and vPvM substances is essential due to their persistence, mobility and potential impact on water quality. The new rules entered into force 20 April 2023. From this date, the Member States may propose harmonized classification and labelling (CLH) with the new hazard classes and manufacturers, importers, downstream users and distributors may also self-classify their substances and mixtures accordingly.

There are transitional periods following the Delegated Regulation's into force. During these periods classification under the new hazard classes is voluntary. which manufacturers, importers, downstream users and distributors are not yet required to classify their substances or mixtures according to the new hazard classes. During these periods, the new hazard classes can be applied on a voluntary basis. However, if a chemical product is classified according to these new hazard classes it will be excluded under these criteria.

The requirements for chemical products are particularly relevant to solid fuels impregnated with a flammable chemical such as oil, stearin, grease, wax, etc. or to which binding agents have been added. This is a standard requirement, that is set due to the precautionary principle and is only partially adapted to the product group. The requirement is intended to exclude problematic substances that are not necessarily found in solid fuels and fire lighting products on the market today.

Based on an internal update of the chemical framework requirements for non-chemical NSE products the restrictions on hazard classification acute tox 4 was removed from O8 after consultation.

Exemptions

Fatty acid (methyl esters), classified as harmful to the environment with hazard statements H400 (very toxic to aquatic life) and H411 (toxic to aquatic life with long-lasting effects) are

¹⁶ <http://www.bsci-intl.org/> (2016-12-22)

exempted from the requirement. At present, methyl esters produced from rape, sunflowers, palm oil/palm kernel oil are more or less the only alternative available as a substitute for petroleum-based oil (paraffin), which is dominant in the fire lighting products market today. The fossil paraffin oil is classified as H304 (May be fatal if swallowed and enters airways) and is therefore subject to special regulations for the labelling of oils¹⁷. Methyl esters produced from palm oil are not classified under this hazard category. As mentioned earlier Nordic Ecolabelling do not permit palm oil and soybean oil. Thus, stearin based on fatty acids produced from animal by-products is an alternative.

A polymer must be added to thicken gel fire lighting products consisting of ethanol. To activate the polymer, it is necessary to add an auxiliary chemical which is classified with H412. The finished gel fire lighting product normally contains less than 0.5% by weight of the auxiliary chemical (thickener). According to manufacturers of gel fire lighting products, it is not possible to substitute the auxiliary chemicals, which therefore has been exempted from the H412 requirement up to a maximum of 0.5% by weight.

Nordic Ecolabelling allows so-called thickened liquid fire lighting products, where adhesives and soap are added to fatty acids, which solidify when cooled. The type of adhesive most used are formaldehyde-based adhesives, which make up 1-10% of the fire lighting products and are thus classified as H341 and H350. Formaldehyde is a toxic and sensitising agent that has a carcinogenic effect, and its use must therefore be restricted as much as possible. Nordic Ecolabelling does not want to make an exception for formaldehyde-based adhesives, making it difficult for thickened liquid fire lighting products to be awarded an ecolabel.

Background to O9 Classification of ingoing substances

This is a standard requirement, that is set by the precautionary principle and is only partially adapted to the product group. The requirement is intended to exclude problematic substances that are not necessarily found in products on the market today. Nordic Ecolabelling strives to ensure that the health and environmental impact of the products are as low as possible. The requirements therefore make it clear that chemical products with ingoing substances with the abovementioned classification cannot be used in the production of Nordic Swan Ecolabelled solid fuels and fire lighting products.

3.4 Energy

Background to O10 Fossil energy sources

Energy from fossil sources must only be used for starting the process of drying/cooking/distillation of raw materials to produce pellets, wood briquettes, wood chips, firewood and barbeque charcoal/briquettes. Based on assessment of the industry and dialogue with relevant producers in 2025, it was found that the share of fossil fuels can be lowered significantly from the level of 10% in generation 3 of the criteria and are now set to maximum 3% of the total annual energy consumption. For barbeque charcoal and briquettes, the requirement covers both the start-up process for drying and the actual distillation. The requirement for energy consumption includes the manufacturer's own

¹⁷ <http://mst.dk/virksomhed-myndighed/kemikalier/regulering-og-regler/faktaark-omkemikalierereglerne/lampeolier/>

production of pellets, briquettes, wood chips, firewood and barbecue charcoal/briquettes and possible energy used for drying/cooking/distilling of raw materials at external suppliers.

Natural gas or diesel are the primary fossil energy types alternatively used in the raw material drying process in the production of solid biofuels. Nordic Ecolabelling categorises peat as a fossil fuel.

Background to O11 Energy consumption in the production of firewood, pellets, wood briquettes and barbecue charcoal and briquettes

From an LCA-perspective the main part of the energy is used for drying of wet raw materials. A report published by the Swedish pellets industry shows that in the production of pellets (sawmills + pellet plants), when the moisture content of raw materials is 50-55%, 66% of the energy is used to dry the raw materials, 33% is used to power the machinery (electricity) and 1% is used for transportation. If pellet production is extended to the whole life cycle, energy is also used to operate machinery in the forests, to transport raw materials out of the forests to the pellet plants, to transport processed raw materials and during the combustion phase. However, these are still limited quantities compared to the production phase¹⁸.

Energy consumption to produce pellets and wood briquettes is significant, and the drying of damp raw materials is the process that consumes most energy. Furthermore, the RPS analysis shows that there is limited potential for the energy requirement to include all the processes that use electricity to power the machinery, since the pellet factories primarily use the same electricity-powered technologies (debarking, chipping, grinding, pressing, cooling and sifting). The requirement for energy consumption therefore only covers energy for the drying/boiling process in this version 4 of the criteria, as in previous versions.

Energy used in the pellet-drying process

The requirement limit is based on how much energy is needed to remove water from the raw material. Sawdust used to produce pellets usually has a moisture content of 50-55% prior to drying. After drying, the moisture content should be below 8%. Nordic Ecolabelling has compiled data on the use of energy in different drying models that are used in pellet plants to remove 1 tonne of water from biomass. See Table below.

Energy consumption for the evaporation of one tonne of water from biomass.

Type of dryer	kWh per tonne of evaporated water
Direct-fired dryers	
Rotary (drum dryer) ¹⁹	1000
Bed/conveyor (belt dryer) ²⁰	1050-1350
Low-temperature dryer ²¹	1000
Indirect-fired dryers	
Steam dryer (Super-heated steam dryer) ²²	750

¹⁸ CHEN S: "Life Cycle Assessment of Wood Pellet", Department of Energy and Environment - Division of Environmental System Analysis CHALMERS UNIVERSITY OF TECHNOLOGY, Göteborg, Sweden, 2009

¹⁹ Thek, G & Oberberger, I. 2010. The Pellet Handbook: The Production and Thermal Utilization of Biomass Pellets.

²⁰ ibid

²¹ ibid

²² ibid

Steam dryer (ÅF 2005) ²³	810
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Nordic Ecolabelling wants to set energy requirement that makes it possible to comply with the energy requirements of the Nordic Ecolabel using both direct- and indirect fired technologies. The requirement level ensures that the most energy-demanding production sites do not meet the requirements. Moreover, O11 Fossil energy sources require renewable raw materials to be used in the dryers, which is the most energy-demanding process.

Electricity cannot be used as an energy source for drying/cooking/distillation unless the electricity is locally produced on-site from renewable sources, i.e. the producer owns the power generation unit located on the premises.

Barbeque charcoal and barbeque briquettes

There is a high RPS (relevance - potential - steerability) for limiting the energy consumption in the production of barbecue charcoal and barbecue briquettes, where most of the consumption is in the actual production of barbecue charcoal²⁴. This is primarily due to the drying and distillation (pyrolysis) processes, which are very energy intensive. The use of electricity to power the machinery is very limited in relation to these processes, and electricity is therefore exempted from the requirement. Energy is used in the production of barbecue briquettes to dry raw materials (crushed barbecue charcoal mixed with binding agents and water) before and after the briquettes are pressed.

Production technology is of major importance to the energy efficiency and environmental impacts (emissions, particulate matter and uncombusted gases) in the production of barbecue charcoal. A study comparing traditional and modern industrial production of charcoal shows that the production methods differ greatly in energy efficiency and environmental impacts²⁵.

Nordic Ecolabelling sets an energy requirement that ensures that only modern industrial forms of production for charcoal can meet the energy requirements of the Nordic Ecolabel, i.e. forms of production that use retorts and where pyrolysis gases from the distillation process are used to dry raw materials and make the process more efficient. In addition to the energy requirement, there is a requirement for production methodology in requirements O16, which requires that the distillation process must take place in an automatic closed-loop production system, where the flue gasses from the distillation processes are collected and reused in the drying/distillation processes, before they are released into the air.

Based on the above data, Nordic Ecolabelling has set requirements for maximum energy consumption for drying and distillation processes to 4,000 kWh/tonnes of barbecue charcoal and 4,600 kWh/tonnes of barbecue briquettes.

Data from the producers with licensees in generation 3 and a general evaluation of the technology used has shown that the requirement level is found to be sufficiently strict.

To ensure an efficient process, the input of raw materials may not exceed 3000 kg (density oven dry wood/other renewable raw materials) to produce 1 tonne of barbecue charcoal.

²³ ÅF Process. 2005. Internal report that the Nordic Ecolabel commissioned ÅF to prepare prior to the development of version 1 of the pellets criteria.

²⁴ Rousset P. et al: "LCA of eucalyptus wood charcoal briquettes", Journal of Cleaner Production 19 (2011) 1647e1653

²⁵ <http://envimpact.org/node/153> viewed 4 June 2016

Electricity cannot be used as an energy source for drying/cooking/distillation unless the electricity is produced on-site from renewable sources.

Firewood

In generation 4 of the criteria, an energy requirement for drying of firewood is introduced. It must either be dried by natural processes or be dried in an industrial process with an energy consumption for the drying process of maximum 225 kWh/tonne firewood on an annual basis. The threshold limit is set based on data from a large supplier of drying equipment for the industry. A typical drying system can dry wood from 55% water content to 20% water content using 273 kWh/m³ without heat recovery and 192 kWh/m³ with heat recovery. This requirement will steer towards partial natural drying or systems with heat recovery. This will ensure efficient drying processes for NSE firewood. Technical dialogue with the equipment producer has shown that heat recovery units can typically be retrofitted to existing drying equipment.

The threshold limit is fixed and should not be adjusted in accordance with water content of the used firewood.

3.5 Use and quality requirements

Background O12 Quality specifications for pellets, wood briquettes and wood chips

The requirement aims to ensure a good quality, and thus good combustion properties (with less harmful emissions) of pellets, wood briquettes and wood chips. The requirement is at the same level as in generation 3 of the criteria.

Pellets

Bioenergy Europe, and the European Pellet Council (EPC) has developed its own quality assurance standard for pellets, ENplus, which is based on the specifications of the ISO 17225-2 standard but has stricter limits for individual quality parameters. Nordic Ecolabelling's required quality parameters and limit values for pellets are identical to the finest quality A1 in the latest ENPlus standard ENplus® ST 1001:2022.

The standards to analysis methods to Fines and Ash melting point temperature has been updated compared to Generation 3, since the standards referred to in Generation 3 are no longer valid. However, regarding analysis of Fines, Nordic Ecolabelling will also accept tests according to the old standard ISO 18846, since EN Plus still refers to that standard.

Moisture content: The requirement for the moisture content of pellets ($\leq 10\%$) is unchanged in relation to version 3, which is the same level as ISO 17225-2 and ENplus. Water is naturally bound in wood and if the percentage of water is too high, the heat output will be low and the risk of a build-up of chimney deposits will increase.

A very low water content is not necessarily the same as a good wood pellet, because the wood pellet won't have the required strength unless it has the right moisture content.

Ash content: The requirement for the ash content is kept unchanged in relation to version 3, which is the same level as ISO 17225-2 and ENplus. An ash content of 0.7% by weight

means that only debranched and debarked raw materials may be used in Nordic Swan Ecolabelled pellets and briquettes.

Mechanical durability: The requirement for the mechanical durability is kept unchanged in relation to version 3. The durability of a pellet is an important quality parameter as it affects the pellet's tendency to crumble. The mechanical durability is one of the most important quality requirements for pellets that are used in small boilers for heating private residential properties, since the requirement for a high percentage of fines may cause problems for the automatic feeding system of the boilers²⁶.

Ash melting point: The requirement is kept unchanged in relation to version 3. A requirement for a high ash melting point ensures that slag does not accumulate during combustion²⁷.

Additives: Additives are permitted up to a maximum of 2% by weight. Of that amount, 1.8% by weight may come from the production process and 0.2% by weight from post-production. The requirement level is equivalent to ISO 17225-2 and ENplus for pellets and ISO 17225-3 for briquettes.

ISO 17225-2 permits unmodified additions, such as starch and grease from agricultural and forestry operations in the pellet production process. Grease may reduce the energy consumption in the pellet pressing process^{28, 29} and starches may increase the mechanical durability of the pellets, i.e. reduce dust from pellets. Some studies show that additives such as lignosulphonate, residues from the production of paper pulp, and different types of starches (potato and corn starch) can cause sintering in the pellet boiler.

Lignosulphonate can also result in higher particle emissions (200 mg/m³ 10% O₂) and emissions of SO₂ in comparison with a normal level of 30-50 mg/m³ 10% O₂) for pellets³⁰.

Many manufacturers market their pellets with the statement "Contains no additives". It is possible to produce pellets with good durability without the use of additives.

Temperature: There is also a requirement for the temperature of the pellets at the last loading point for truck deliveries to end-user at maximum 40 °C. The requirement follows ENplus.

Wood briquettes

Quality properties and requirement levels for briquettes are consistent with ISO 17225-3, Class A1. The reasons to the required quality parameters are the same as for pellets, see above. quality

Nordic Ecolabel permit an uncertainty of $\pm 2\%$ of the requirements for moisture content in relation to the requirements limit $M \leq 12$. This means, that the moisture content may be up to 14%. This is because some producers of briquettes are using chip from wood processing

²⁶ Thek, G & Obernberger, I. 2010. The Pellet Handbook: The Production and Thermal Utilization of Biomass Pellets.

²⁷ Strömberg & Herstad Svärd. 2012 Bränslehandboken (The Fuel Handbook). VÄRMEFORSK ISSN 1653-1248.

²⁸ Haas, J & Hackstock, R. 1998. Brennstoffversorgung mit Biomassepellets. Berichte aus Energie- und Umweltforschung, No 6. Bundesministerium für Wissenschaft und Verkehr. Austria.

²⁹ Ståhl, M. et al. 2014. SUSTAINABLE IMPROVEMENTS IN THE WOOD FUEL PELLET CHAIN Proceedings of SEEP2014, 23-25 November 2014, Dubai-UAE.

³⁰ Rönnbäck, M. et al. 2011. Experimental evaluation of pellet quality - Burners for houses and large buildings. Swedish National Testing and Research Institute SP. Report 2011:60.

industries where the moisture content varies between 12-15%. To avoid having to use extra energy to dry the chip down to under 12%, Nordic Ecolabelling has chosen to confer an uncertainty of $\pm 2\%$ into the requirement boundary. Briquettes are increasingly used by private homeowners in stoves and small boilers as a replacement or supplement to firewood.

This sets high requirement to the stove/boiler as well as the quality of the used briquettes, to ensure a clean and efficient combustion.

Wood chips

Quality properties and requirement levels for wood chips are identical to ISO 17225-4, Class A1 and A2. This is to ensure that the wood chips have a high quality so that it also can be used in smaller boilers.

The reasons to the required quality parameters are the same as for pellets, see above.

Background to O13 Quality specifications for firewood

Firewood is split, dry wood that is primarily used in wood-burning stoves, fireplaces, masonry stoves or solid fuel boilers. The quality of the firewood depends on parameters such as the size and diameter of the log, rot and dust, moisture content and tree species.

The requirement for information on wood species, cross measure, moisture content, heating value and rot, mould and dust correspond to class A1/A2 in standard EN ISO 17225-5:2021. Diameter classes D2 and D5 is designed for firewood intended for kitchen stoves. Diameter Class D15 is intended for stoves, inserts, fireplaces and the like. To have a clean and efficient combustion, it is recommended that the wood has a maximum diameter of 15 cm. Wood with a diameter of more than 15 cm is intended for use in boilers or the like. If the Nordic Swan Ecolabelled wood has a diameter above 15 cm, the actual value is to be stated. To ensure that the consumer receives the same wood quality, a minimum of 85% of the wood must be within the specific diameter class. The wood must also not contain visible rot, mold, dust, or fungus.

Wet firewood can create a build-up of soot in the chimney, which can, in the worst case, form deposits of creosote, which is a sticky, tarry condensate. Creosote increases the risk of the chimney catching fire and can also give off odours and cause discolouration of the walls next to the chimney.

Nordic Ecolabelling requires that the water content of delivered firewood does not exceed 20%, which is identical with the requirement in EN ISO 17225-5:2021. The moisture content of firewood shall be tested a suitable number of times to ensure that the water content of the delivered firewood (crates/boxes or loose loads) does not exceed 20%.

The water content shall be determined using the weighing/drying method. Continuous production control can be done using insertion moisture meters. It must be defined that the measurements are performed systematically and at representative points in the dried firewood stacks to ensure the quality. The outer layer of oven-dried firewood is dry, while the

core is still too wet for it to be used as firewood³¹. The licensee must have quality procedure, which show how the requirements for quality specification is checked regularly.

The fact is that 1 kilo of completely dry wood contains more or less the same amount of energy regardless of what type of wood it is. The calorific value of 1 kg of dry wood (18% moisture) is about 19 MJ/kg (approx. 4.2 kWh/kg). The density is specified as kg per m³ (completely dry wood)³² in appendix 6.

Nordic Ecolabelling requires that the calorific value of the delivered quantity of firewood be disclosed to the purchaser.

Background to O14 Quality specifications for barbecue charcoal and barbecue briquettes

Barbecue charcoal and barbecue briquettes must be tested for compliance with EN 1860-2. The quality of barbecue charcoal/briquettes depends on several parameters, such as the ash, water and fixed carbon content.

The requirement for fixed carbon indicates the ability of the charcoal/briquette to emit heat. The higher the percentage of fixed carbon, the better the quality. In the case of barbecue charcoal, the Nordic Ecolabel requires a fixed carbon content of at least 83% which is stricter than EN 1860-2, Danske Varefakta (DVN) and DINplus, where the requirement is a minimum of 75%, a minimum of 75% and a minimum of 80% respectively. In the case of barbecue briquettes, the Nordic Ecolabel requires a fixed carbon content of at least 68%, which is stricter than EN 1860-2:2005 (min. 60%), DVN (min. 65%) and DINplus (min. 65%). The difference in requirements for fixed carbon content in barbecue charcoal and barbecue briquettes respectively is primarily due to the use of binding agents in the briquettes.

The requirements for ash content indicates how “pure” the materials are from which barbecue charcoal or barbecue briquettes are made. A high ash content after combustion indicates that the products probably contain other materials than wood, e.g. sand, minerals (lignite or stone coal) and others. The lower the ash content, the better the quality.

The ash content of barbecue briquettes is higher than barbecue charcoal due to the content of binding agents. In the case of barbecue charcoal, the Nordic Ecolabel requires that the ash content shall not exceed 4%, which is the same requirement level as that specified by DINplus in their certification standards. However, the requirement is stricter than EN 1860-2 and DVN, where the requirement specifies a maximum ash content of 8%.

In the case of barbecue briquettes, the Nordic Ecolabel requires that the ash content shall not exceed 15%, which is the same level as that specified by DIN plus, but is stricter than EN 1860-2 and DVN, which permits 18%.

The requirement for moisture content says something about the quality of the barbecue charcoal/briquettes. The higher the moisture content, the lower the burning properties. In the case of barbecue charcoal and barbecue briquettes, the Nordic Ecolabel requires that the moisture content shall not exceed 8%, which is the same level as in the previously mentioned standards and certification schemes.

³¹ <http://politiken.dk/forbrugogliv/boligogdesign/energi/ECE2445216/kvalitetsmaerkning-af-braende-skal-goere-faerre-syge-af-braendeovnsroeg/> viewed 6 March 2015

³² http://www.skovforeningen.dk/site/traearternes_egenskaber/ viewed 6 March 2015

To be able to ignite barbecue charcoal/briquettes, they must contain small amounts of volatile components. However, if the content of volatile components is high, flames will be produced instead of the steady glow that you want from the coals/briquettes³³. The requirement is most relevant for barbecue briquettes due to their composition and size. In the case of briquettes, the Nordic Ecolabel requires that the volatile component content shall not exceed 20%, which is the same requirement level as that specified by

Barbecue briquettes are made by compressing pulverised charcoal or heat-treated mineral coal and adding a binding agent such as corn starch or potato starch. The quality of briquettes is thus determined by the quality of the charcoal that is used and what is added at the compression stage. The Nordic Ecolabel requires that binding agents shall not pose any risk to health when the gases that are emitted from the binding agents when burned meet food. The binder must meet food quality standards. At the same time, several organic fossil materials and inorganic materials are not permitted for use in barbecue briquettes. These are organic fossil materials, e.g. stone coal, brown coal and petroleum coke, and inorganic materials, e.g. stone, sand, glass, slag and metal splinters. The requirement is consistent with EN1860-2.

Nordic Ecolabel has gained information that the test for foreign substances in accordance with EN 1860-2: 2005, clause 6.5, is not particularly useful. Nordic Ecolabelling will therefore also accept that this be documented through requirements O1 and O2, together with a statement from the test lab.

The requirement for quality specifications must be documented with a complete test report according to EN 1860-2 and comply with all quality specifications stated in the requirement. The report shall be conducted by an independent testing laboratory.

To ensure that the Nordic Ecolabelled barbecue charcoal/briquettes maintain a high level of quality, Nordic Ecolabelling requires quality control inspections of the Nordic Ecolabelled products to be conducted annually. They shall be tested for compliance with all quality specifications stated in the requirement and shall be conducted by an independent testing laboratory. A test sample must be taken from the manufacturer's warehouse. All reports must be available to Nordic Ecolabelling. If the annual report shows that the requirement is not met, the licensee should contact Nordic Ecolabelling.

Background to O15 Production facilities for barbecue charcoal and barbecue briquettes

Nordic Ecolabelling has several requirements for production facilities, for both barbecue charcoal and barbecue briquettes, to ensure that the products are manufactured under controlled conditions and in an environmentally responsible and energy-efficient manner. The production of barbecue charcoal and briquettes must take place at a permanent production facility with the infrastructure to support the operations ensures that mobile production facilities cannot be used in a Nordic Ecolabelled production. The use of transportable metal vessels/drums or primitive earth/clay kilns for charcoal production is very common in Africa and South America, for example. The mobility of these production facilities makes it simple to transport them to wherever the raw material (wood) is and thus, potentially, use timber that has been harvested illegally. Moreover, this form of production is

³³ <http://gryfskand.pl/en/business-areas/charcoal-products/terminology/>, viewed 4 July 2016

linked to serious health impacts for the workers (emissions of unburned gases in the distillation process and particulate matter/coal dust), and the use of safety and protection equipment is very limited³⁴.

The requirement saying that the distillation process must take place in an automatic production system where the flue gasses from drying and distillation processes is collected and reused in the drying/distillation processes, before they are released into the air, ensure that only “modern” methods of producing barbecue charcoal/briquettes (retort technologies) meet the Nordic Ecolabel requirements. The requirement also ensures that air emissions are reduced significantly compared to the primitive production technologies (metal vessels or earth/clay miler), where the flue gas is discharged directly into the air.

The requirement covers all sites where barbecue charcoal and barbecue briquettes that are included in a Nordic Ecolabel licence are manufactured. If an applicant only manufactures barbecue briquettes, then the requirement covers subcontractors of barbecue charcoal/residues from barbecue charcoal production.

Background to O16 Quality specifications for fire lighting products

Fire lighting products must be tested for compliance with EN 1860-3:2023. The quality of fire lighting products mainly depends on how efficiently and effectively a fire lighting product transfers its energy in the form of fire/heat to the product (for example, firewood or barbecue charcoal/briquettes) that you wish to light. At the same time, the product must be safe to use for lighting (i.e. in its packaging) and when the product is lit. The EN 1860-3:2023 standard has requirements for the safety of fire lighting products, how effectively they perform and for their packaging.

The requirement in terms of quality is that the fire lighting product must be easy to ignite, and the fire must spread quickly across the surface of the whole fire lighting product to ensure high heat generation.

The requirement must be documented with a complete test report to show that the fire lighting product complies with the EN 1860-3:2023 standard.

Background to

O17 Information to consumers - pellets, wood briquettes, wood chips and firewood,

O18 Information to consumers - barbecue charcoal and barbecue briquettes

O19 Information to consumers – fire lighting products

The requirement shall ensure that consumers are provided with relevant information about the products at the time of purchase, regarding relevant quality parameters and information about raw materials and place of production. The information may also be used to compare the requirements of the Nordic Ecolabel with other similar types of products.

The requirement to barbecue charcoal and barbecue briquettes has been updated in generation 4 of the criteria to also require information of origin, both country of production site and country of raw material origin. There are issues with opacity and fraud at different links in the charcoal value chain; from illegal timber trade to fraud in certification and there is

³⁴ FERN Report (August 2015): “Playing with fire – Human misery, environmental destruction and summer BBQs”

often a lack of information on the charcoal bags³⁵. Origin information on the bags increases the transparency and helps the consumer make a responsible choice.

The requirement for pellets, wood briquettes, wood chips and firewood has been updated in generation 4 of the criteria to require information of country of origin of the wood raw material origin.

Background to O20 Yearly audit of barbecue charcoal and barbecue charcoal briquettes production sites

There have been indications that trade in charcoal from illegally harvested forests has taken place on a large scale, mainly in regions in African and South America. Moreover, the illegal trade in charcoal risk financially supports terrorist groups in Nigeria, Somalia, etc.³⁶.

Imported charcoal has been repacked and sold under false origin information in Europe.

According to a market analysis from WWF the proportion of illegal charcoal imported into the EU each year can be estimated at the equivalent of 1.6 to six million cubic metres of wood³⁷.

The article "Microscopy illuminates charcoal's sketchy origins" claim that nearly half of the barbecue charcoal sold in Europe contains wood from tropical and subtropical forests. This finding raises concerns about illegal logging and mislabelling within the charcoal industry³⁸.

With the upcoming EUDR-regulation there will be stricter rules to traceability of charcoal than today, since charcoal has not been part of the previous timber regulation. To ensure that the wood raw materials used in Nordic Swan Ecolabelled barbecue charcoal/briquettes are legal and sustainably produced, Nordic Ecolabelling has stringent requirements for the use of certified wood and traceability. However, to further increase the control of wood origin Nordic Ecolabelling require that the licensee hire an external independent third-party inspector, to control the fulfilment of several requirements. In this generation 4 of the criteria the yearly audit of charcoal production is stated in a separate requirement (instead of a part of the requirements to production facility). The requirements to the yearly audit have also been made clearer, so avoid misinterpretations.

Assessing the energy consumption of the production facilities of charcoal and briquettes is complex. To ensure proper verification of the requirement, it is included in this requirement for yearly audit. Nordic Swan ecolabel has identified a minimum list of essential parameters and assumptions that must be controlled to ensure the quality of the energy calculation.

³⁵ [2020_12_WWF_TI_ForCon_Grillkohle_EU_EN_fin\(3\).pdf](#)

³⁶ Nellemann, C., Henriksen, R., Raxter, P., Ash, N., Mrema, E. (Eds). 2014. The Environmental Crime Crisis – Threats to Sustainable Development from Illegal Exploitation and Trade in Wildlife and Forest Resources. A UNEP Rapid Response Assessment. United Nations Environment Programme and GRID-Arendal

³⁷ WWF Germany (2020), Analysis of the EU Charcoal Market.

³⁸ Nature (2020), Microscopy illuminates charcoal's sketchy origins. [Microscopy illuminates charcoal's sketchy origins](#)

Background to O21 Control of wood species in barbecue charcoal and briquettes

According to WWF charcoal has been sold under false origin claims. Some suppliers have falsely claimed that their charcoal comes from sustainable or legally harvested sources when it may originate from endangered forests or unauthorized locations^{39, 40}.

The Nordic Ecolabelling performs different types of compliance checks, both planned and unannounced compliance checks, after a licence is granted. For barbecue charcoal there are possibilities to detect species and sometimes origin through 3D-reflected light microscopy, DNA or isotopic analysis to verify compliance with requirement O3.

3.6 Licence maintenance

Background to 022 Customer complaints

Nordic Ecolabelling requires that your company has implemented a customer complaint handling system. To document your company's customer complaint handling, you must upload your company's routine describing these activities. The routine should be dated and signed and will normally be part of your company's quality management system.

If your company does not have a routine for customer complaint handling, it is possible to upload a description of how your company perform these activities. During the on-site visit, Nordic Ecolabelling will check that the customer complaint handling is implemented in your company as described. The customer complaints archive will also be checked during the visit.

Background to 023 Traceability

Nordic Ecolabelling requires that your company has implemented a traceability system. To document your company's product traceability, you must upload your company's routine describing these activities. The routine should be dated and signed and will normally be part of your company's quality management system.

If your company does not have a routine for product traceability, it is possible to upload a description of how your company perform these activities. During the on-site visit, Nordic Ecolabelling will check that the product traceability is implemented in your company as described.

4 Environmental impact of solid fuels and fire lighting products

To ensure that requirements are set in the entire life cycle of the service, a MECO (material, energy, chemicals and other impacts) analysis is performed for the following phases: raw material, production, use and end of life phase.

³⁹ [Holzkohle: Das schmutzige Geschäft mit Tropenholz | NDR.de - Ratgeber - Verbraucher](#)

⁴⁰ WWF Germany (2020), Analysis of the EU Charcoal Market.

Nordic Ecolabelling sets requirements concerning the topics and processes in the life cycle that have a high environmental impact – also called hotspots. R represents the environmental relevance; P is the potential to reduce the environmental impact, and S is the steerability on how compliance with a requirement can be documented and followed up. The criteria contain requirements in those areas in the life cycle that have been found to have high RPS, since there is potential to achieve positive environmental gains.

RPS scheme

Life cycle stages	Area and assessment of R, P, S (high, medium or low)	Comments
Raw materials		
	Raw material extraction R: High P: High S: Medium	R: The product group consist of 100% renewable material, mostly wood (virgin wood, different wood by-products) but also residual vegetable materials from forestry an agriculture. Modern forestry means risks with biodiversity loss, changed possibilities for the forest to act as a carbon sink, etc. There is a risk of deforestation and illegal logging, and potential use of tropical wood species linked to the production of barbecue charcoal and barbecue briquettes. Relevance is high. P: The potential should be high since there are better and worse forestry. S: The possibility to put requirement on certified wood (PEFC and FSC) is good but there have been issues regarding the control from the certification organizations. It is profitable to cheat with forestry certification, which has been demonstrated, among other things, with a barbecue charcoal manufacturer that sells on the Nordic market. Steerability is medium.
	Energy use in forestry R: High P: Low S: Low	R: A relatively large amount of energy is used in this first step in the life cycle (i.e. Forestry), although less than in the production phase. Fossil fuels are used in forest machines and work tools. Renewable fuels are probably not used to a high extent. This means that the climate impact is relatively larger than the production phase. For example, for pellets produced in Sweden, 40-60% of the GWP are addressed to the raw material production and not to drying and production of pellets. Since the amount of energy is lower than in production the relevance is medium. But the climate impact is higher due to a high share of fossil energy. Relevance is totally high. P: The potential is probably still quite low, since fossil fuels are still standard in forestry. S: The steerability is low due long supply chains (many small subcontractors). Energy is not included in forestry-certification systems.
Production/distribution		
	Energy use in production R - High P - Medium S - Medium	R: The majority of the total energy consumption originates from the actual production (sawmill + production) of the wood pellets. This is because the processes of cutting, chipping, drying, crushing/shredding and pressing wood pellets require a lot of energy. For firewood, energy is required for splitting, cutting and drying. Probably the energy consumption should be almost as high as for pellets. Also, to produce barbecue charcoal and barbecue briquettes, the largest amount of energy is required in the manufacturing phase. It is the processes of drying, combustion/pyrolysis and pressing into briquettes that are energy demanding. Relevance is high due to production being the most energy consuming phase.

		P: For pellets production there exist different drying technologies that differ in energy efficiency to some extent, thus the potential is assessed to medium. For charcoal, there is a great variation in energy efficiency between simple old-school processes and modern, advanced retort kilns production facilities. Some modern plants capture the gases released from the wood and reuse them as fuel for the kiln, creating a more sustainable cycle. For firewood – the potential is medium as there is both natural drying and industrial drying with and without heat recovery on the market. S: Steerability is assessed to be low for the producer, since efficient technologies are connected to high investment costs. However, the steerability for the Nordic Ecolabelling is high, since only the most efficient factories can obtain a label.
	Energy source in production R - High P – Medium high/high S - High	R: The energy for drying in pellet production and probably also firewood, is normally produced from biofuels, at least for Swedish conditions. Fossil fuels for drying would increase the emissions significantly. Electricity is also needed for machinery. In modern production of barbeque charcoal and barbeque the gases emitted in pyrolysis are collected and used as fuel in the production process. Relevance is high since the climate impact is highly affected by the energy source. P: The potential is high to use biofuel since the raw material can be used as energy source in the same production. In barbeque charcoal production biogas can be used instead of fossil gas. S: The steerability is high.
	Chemicals in production R - Medium P - Medium S - High	R: Natural wax, plant oils and binders (usually starch from natural sources like for example wheat) are used in the production of pellets, charcoal briquettes and fire lighting products. Binders stands for approximately 10% of the total GWP from production of pellets. Relevance is medium. P: Potential is a bit unclear as NSE's experience on the chemicals used is limited. P is medium. S: The steerability is high to put requirements on both the feedstock for the chemicals and the properties.
	Social conditions R- High P - High S -Medium	R: Risk of bad working conditions (violation of human rights even slavery conditions) mainly in the manufacturing of barbeque charcoal and barbeque briquettes and mainly when imported from countries outside of EU. Dust formation during manufacturing implies an occupational health risk. Overall, the relevance is high. P: Working conditions vary from bad to according to good/standard practice, thus the potential is high. S: Requirements on working conditions are easy to put but harder to follow up in a secure way. Steerability is medium.
	Transportation of raw materials R – medium/Low P – Low S – Low	R: The transport of raw materials has some impact on the total environmental performance, since it is heavy loads that are transported. However, in the overall life cycle perspective the relevance is medium/low. P: Potential is often low as the raw materials must be transported by truck from e.g. the forest areas to the production site. No good alternatives seem to be available. S: Steerability is assessed to be low.

Use phase		
	Greenhouse gas emissions R - Low P - Low S - Low	R: All combustion of biofuels releases greenhouse gas emissions, but this product group will not contribute to a net climate impact, since the emissions are defined as biogenic carbon. A minor part of the total energy used for pellets as domestic heating corresponds to use phase as combustion demands electricity for feed screw and fans. Relevance is low (provided that the raw material/fuels are renewable/no change in the product group) P: The potential is low. Emitted greenhouse gases can only be captured in big plants BeCCS. S: The Nordic Ecolabel has low steerability on if solid biofuels are used instead of fossil fuels, for example firewood on stoves lowering the electricity use for domestic heating. Or a pellet oven installed instead of a oil burner.
	Emissions/pollutants to (outdoor) air R - Medium P – Medium S – Medium	R: Combustion of biofuels release significant quantities of various pollutants, including particulate matter (PM), polycyclic aromatic hydrocarbons (PAHs), carbon monoxide (CO), volatile organic compounds (VOCs), trace metals, and other minor pollutants. The concentrations of air pollutants are determined by the simultaneous influences of various factors, including fuel quality, combustion conditions. Relevance is medium. P: The potential to choose different raw material and to affect the fuel quality is assessed as medium. S: The Nordic Swan can put requirements on different fuel quality parameters that can be tested in a standardized way.
	Transportation of products R - Low P – Medium S – Low	R: The transport distance from producers to retailer has some impact on the total environmental performance since the transport distances can be long. However, often transport will be done efficiently with fully loaded truck/ship loads. Transportation from retail to consumer cannot be neglected in the life cycle. It can sum up to 10-15% of the total GWP for pellets. In the overall life cycle perspective, the relevance is low. P: Potential is medium since there are different means of transportation (boat, railway, trucks) although trucks have advantage of being fast, and relatively cheap. S: Steerability is assessed to medium or low to the retailer. Transport done by the end user has no/low steerability.
End of life		
	End-of-life handling of ash R - Low P - High S - Low	R: Ash from incineration can be used to return nutrients to the ecosystem if the ash is composted or spread on the ground. But there could also be risk of spread of harmful substances when ash is spread on nature in large quantities. The raw materials and the quality parameters affect the ash volume. Relevance is low. P: There are different means of disposing of ashes rendering from spreading it on plants in your garden, in private compost or in the waste sent to incineration. S: Our steerability is low. Some information could be written on the packaging on how to return ashes.

MECO scheme

	Raw material	Production	Use	End of life	Transport
Material	Wood raw materials (virgin wood, residual products) are the main raw material for all solid fuels and fire lighting products. The product group consist of 100% renewable material. Risks and negative aspects see "Other". Pellets are often produced from sawmill by-products such as wet sawdust, dry sawmill chips and roundwood), but it may happen that whole trees are used for pellets production. Wood by-products is less often used for barbecue charcoal, even if it occurs. Instead, hardwood trees are harvested specifically for barbecue production. Grill briquettes consist of the undersized dust from charcoal production, pressed to briquettes. Residual vegetable materials from forestry and agriculture such as straw, seed kernels and husk are also used to some extent.	Paper- and plastic bags or cardboard containers. Fire lighting products can be single-packaged in plastic bag made of PE/PET though packaging almost often the case for paraffin –firelighters.	All combustion of biofuels releases greenhouse gas emissions (biogenic). Raw material selection has an impact on function and quality parameters such as moisture content, size distribution, strength, etc.	Ash from incineration can be used to return nutrients to the ecosystem if the ash is composted or spread on the ground. Ash is also handled as residual waste. The raw materials and the quality parameters affect the ash volume. The GWP share from end-of-life packaging is significantly reduced when cardboard is used as packaging material compared to plastic bags (4). The same is probably valid if paper bags are used.	
Energy	A relatively large amount of energy is used in the first step, forestry. Fossil fuels are used in forest machines and work tools. Renewable fuels are probably not used to a high extent. Pellets: 40-60% of the GWP produced in Sweden are addressed to the raw material production and not to drying and production of pellets (5).	For pellets, the majority of the total energy consumption originates from the actual production (sawmill + production) i.e. cutting, chipping, drying, crushing/shredding and pressing wood pellets. For firewood, energy is required for splitting, cutting and drying. Probably the energy consumption should be almost as high as for pellets.	A minor part of the total energy used for pellets as domestic heating corresponds to use phase as combustion demands electricity for feed screw and fans (1). The use phase of solid fuels and fire lighting products gives a positive contribution of energy and is often considered "carbon-	Na	Transportation of raw materials from e.g. forest to production sites. In addition, transport from production site to retailer. Transport is typically done

		The energy for drying in pellet production is normally produced from biofuels, at least for Swedish conditions (5). Electricity is also needed for machinery. The estimated typical emissions from Swedish pellet production are approx. 3-4 kg CO₂eq/MJ pellets for all three types of raw materials (sawdust, dry sawmill chips and roundwood). Oil for drying will increase the emissions significantly, too approximately 19 kg CO₂eq/MJpellets (5). Also, for the production of barbecue charcoal and barbecue briquettes, the largest amount of energy is required in the manufacturing phase. It is the processes of drying, combustion/pyrolysis and pressing into briquettes that are energy demanding (2). Modern, industrial-scale kilns are more efficient than traditional ones and use the low-oxygen pyrolysis gases to heat the process. Electricity consumption for raw material processing is higher for pellets produced from roundwood (5).	neutral" as the trees absorb CO₂ during their growth. However, the carbon neutrality of wood pellets is debated. If forests are not sustainably managed, the carbon release could surpass the carbon absorbed. The transport distance has some impact on the result since the transport distances can vary a lot between producers and users and the products are bulky (5). Transportation from retail to consumer cannot be neglected in the life cycle. It can sum up to 10-15% of the total GWP for pellets (5).		by diesel trucks.
Chemicals	Na	Natural wax, plant oils and binders (usually starch from natural sources like for example wheat) are used in the	Combustion of biofuels also release significant quantities of various pollutants, including particulate matter (PM), polycyclic	Risk of spread of harmful substances when ash is spread on nature.	

		production of pellets, charcoal briquettes and fire lighting products. Binders stands för approximately 10% of the total GWP from production of pellets (5). Paraffin (fossil) or stearin wax can be added to fire lightning products.	aromatic hydrocarbons (PAHs), carbon monoxide (CO), volatile organic compounds (VOCs), trace metals, and other minor pollutants. The concentrations of air pollutants are determined by the simultaneous influences of various factors, including fuel quality, combustion conditions. Charcoal briquettes tend to have higher emissions compared to lump charcoal. Wood pellets tend to burn more cleanly than traditional firewood or coal, producing lower levels of harmful emissions		
Other	Risk for unsustainable forestry with biodiversity loss, changed possibilities for the forest to act as a carbon sink/carbon release from ecosystem, etc. The problems are more connected to the harvesting of whole trees, than to residues and wastes. Articles in the media have shown the risk of illegal logging and potential use of tropical wood species linked to the production of barbecue charcoal and barbecue briquettes. Deforestation, due to the production of charcoal globally, is today a huge problem, especially in the tropical regions. In a scientific paper from 2013, it is assumed that 7% of the deforestation in the tropical regions goes to the production of charcoal (3).	Risk of bad working conditions (violation of human rights, slavery) mainly in the manufacturing of barbeque charcoal and barbeque briquettes.in developing countries. Dust formation during manufacturing implies an occupational health risk.	Na	Na	

Sources for MECO

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