Nordic Ecolabelling for

Liquid and gaseous fuels

Version 5.0 • date – date

CONSULTATION

Nordic Ecolabelling

Contents

099 Liquid and gaseous fuels, version 5.0, 23 June 2026

Contact information

In 1989, the Nordic Council of Ministers decided to introduce a voluntary official ecolabel, the Nordic Swan Ecolabel. These organisations/companies operate the Nordic Ecolabelling system on behalf of their own country's government. For more information, see the websites:

Denmark

Ecolabelling Denmark

www.svanemaerket.dk

Iceland

Ecolabelling Iceland

www.svanurinn.is

Finland

Ecolabelling Finland

www.joutsenmerkki.fi

Norway

Ecolabelling Norway

www.svanemerket.no

Sweden

Ecolabelling Sweden

www.svanen.se

1 Summary

Nordic Ecolabelling criteria for liquid and gaseous fuels has been revised to generation 5. The overall aim of the revision has been to ensure that the criteria continue to secure a positive environmental benefit via ecolabelling and that the criteria are viable and clear for the industry.

To obtain an overview of the key environmental impacts throughout the life cycle of the product group, a qualitative MECO analysis has been carried out for the relevant areas. This was followed by an overall RPS (Relevance-Potential-Steerability) analysis to identify the areas where NSE can set requirements with the greatest environmental impact, read more under chapter 6 Environmental impact of liquid and gaseous fuels. High RPS was found for the following:

- Raw materials and feedstocks used in liquid and gaseous fuels
- GHG-emission reductions compared to the fossil alternative
- Quality of the liquid and gaseous fuels
- Methane leakage from biogas production

The revision has focused on updating the criteria in relation to the Renewable Energy Directive (2018/2001/EU), as amended by Directive (2023/2413/EU). Furthermore, the revision has focused on strengthening the requirement on greenhouse gas reduction across all fuels and introduces a stricter limit on additives of non-renewable origin.

In addition, all fuels must now be based on biomass classified as waste or residues. Previously this only applied to gaseous fuels. Furthermore, for biogas specifically, a ban on energy crops has been introduced, together with stricter requirements for the control of methane leakage from biogas production. The revision also introduces a new requirement aimed at improving control and traceability of used cooking oil (UCO) as a raw material, along with a clearer position on the use of tall oil.

Finally, four requirements have been removed from the criteria following the assessment that they are no longer relevant due to stricter legislation or changing market conditions.

The most important changes within this revision are presented in Table 1.

1.1 Changes compared to previous generation

All changes and updates to the requirements in generation 5 compared to previous generation 4 are summarized in Table 1 below. Further details on the requirements are provided in Chapter 5.

Table 1 Overview of changes to criteria for Nordic Swan Ecolabelled liquid and gaseous fuels generation 5 compared with previous generation 4.

Gen. 5	Gen. 4	Same req.	Change	New req.	Comments
Product group definition					
Product group definition	Product group definition	X			Editorial change to enhance clarity.
Description of the product					
O1 Description of the product(s)	O1	X			Same requirement.
Resources					
O2 Material composition	O2		X		Strengthened requirement. - All fuels must be based on waste/residues (previously only gaseous fuels). - Maximum 3% of additives of non-renewable origin is allowed (previously 10%).
O3 Raw materials not allowed to use	O6		X		Strengthened requirement. Energy crops are now restricted in biogas production.
O4 Used cooking oil (UCO)				X	New requirement.
O5 Genetically modified plants	O7	X			Same requirement.
O6 Traceability and control of vegetable and animal feedstocks	O3		X		Changed requirement. Now only applies to licensees in countries that are not EU Member States, where Directive (EU) 2018/2001 as amended by Directive (EU) 2023/2413 has not yet been incorporated into national legislation. This means that, in the Nordic countries, it now only applies to licensees located in Norway and Iceland. Licensees in Sweden, Denmark and Finland fulfil the requirement since they are EU member states.
Greenhouse gas emission savings					
O7 Reduction of greenhouse gases	O8		X		Strengthened requirement. - Stricter levels on reduction of GHG. For biogas harmonized minimum of 90% GHG reduction for all Nordic countries (previously a range between 70-90% for the different Nordic countries). For liquid fuels a minimum of 85% GHG reduction (previously 75%).
O8 Control of methane leakage from biogas production	O9		X		Strengthened requirement. - Real-time monitoring system or LDAR programme is added.
Quality requirements					
O9 Quality specifications	O11		X		Editorial change. - Changed to relevant updated fuel quality standards.

License maintenance					
O10 Customer complaints	O12	X			Same requirement.
O11 Traceability	O13		X		Editorial change. - Requirement adapted to industry practises for liquid and gaseous fuels.
O12 Follow-up on license	O14	X			Same requirement.
Removed requirements in gen. 5 compared to gen. 4					
	O4				Removed. "Tree species with restricted use" evaluated not to have high relevance anymore due to the updated requirement O2 where all fuels must be based on waste/residues.
	O5				Removed. "Wood raw material" evaluated not to have high relevance anymore due to the updated requirement O2 where all fuels must be based on waste/residues.
	O10				Removed. "Working conditions" evaluated not to have high relevance compared to other requirements and market conditions.

2 Environmental communication guideline for Nordic Swan Ecolabel liquid and gaseous fuels

Nordic Swan Ecolabel liquid fuels:

- Are made from biomass defined as waste or residues.
- Has reduced greenhouse gas emissions by at least 85% compared to the fossil alternatives*.
- Are not produced from primary food and feed crops or genetically modified plants.
- Are not produced using feedstocks such as virgin palm oil, residues or waste from palm oil production or soy oil.
- Comply with recognized fuel standards to ensure good combustion characteristics.

Nordic Swan Ecolabel gaseous fuels:

- Are based on biomass defined as waste or residues (mass balance accepted).
- Has reduced greenhouse gas emissions by at least 90% compared to the fossil alternatives*.
- Are produced on a production plant that have measures to reduce methane leakage.
- Are not produced from primary food and feed crops, energy crops or genetically modified plants.
- Are not produced using feedstocks such as virgin palm oil, residues or waste from palm oil production or soy oil.
- Comply with recognized fuel standards to ensure good combustion characteristics.

** Calculated according to the principles of Article 31 of the Renewable Energy Directive (2018/2001/EU), as amended by Directive 2023/2413/EU*

Why choose the Nordic Swan Ecolabel?

- Liquid and gaseous fuels may use the Nordic Swan Ecolabel trademark for marketing. The Nordic Swan Ecolabel is a very well-known and well-reputed trademark in the Nordic region.
- The Nordic Swan Ecolabel is a simple way of communicating environmental work and commitment to customers.
- The Nordic Swan Ecolabel clarifies the most important environmental impacts and thus shows how a company can cut emissions, resource consumption and waste management.
  Environmentally suitable operations prepare liquid and gaseous fuels for future environmental legislation.

- Nordic Ecolabelling can be seen as providing a business with guidance on the work of environmental improvements.
- The Nordic Swan Ecolabel not only covers environmental issues but also quality requirements since the environment and quality often go hand in hand. This means that a Nordic Swan Ecolabel licence can also be seen as a mark of quality.

3 What can carry the Nordic Swan Ecolabel?

The product group comprises liquid and gaseous fuels for transport (road, sea, and air), heating and industrial purposes. The fuels are based on 100% biomass that are defined as waste or residues. Further, no food- and feed crops are used as raw materials.

Gaseous fuels also include liquefied biogas (LBG), compressed biogas (CBG) and bio-LPG (also called renewable propane or bio-propane).

The following fuels cannot be Nordic Swan Ecolabel according to these criteria:

- Solid fuels, which are covered by a separate criteria document.
- Other energy carries and related products, such as electricity, hydrogen, electro fuels, lubricating oils, and fire lighting products.

3.1 Justification of the product group definition

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

The product group includes, as in the criteria generation 4, liquid and gaseous fuels for road transportation and for heating and industrial purposes as defined under the Renewable Energy Directive (2018/2001/EU), as amended by Directive 2023/2413/EU .[1]

In generation 4 of the criteria it became possible to ecolabel Bio-LPG. Bio-LPG i.e., propane/butane typically produced from the production of renewable (or HVO) biodiesel and sold in both bottles/cylinders. Bio-LPG can also be called renewable propane and bio-propane.

In generation 5 of the criteria all fuels are restricted to be based on raw materials defined as waste or residues.

To have a clear product definition the product group includes only liquid and gaseous fuels for transport, heating, and industrial production in the product definition.

Other energy carriers and related products cannot be Nordic Swan Ecolabelled due to different arguments:

- Solid fuels cannot be Nordic Swan Ecolabelled according to these criteria but can be Nordic Swan Ecolabelled according to criteria for solid fuels.
- Electricity cannot, as in the previous criteria generations, be Nordic Swan Ecolabelled. Electricity is not a physical sales product in the same way as other energy carriers, and the Nordic Ecolabel does not aim to act as a certification body for electricity.
- Hydrogen cannot, as in the previous criteria generations, be Nordic Swan Ecolabelled. Hydrogen is expected to play a key role in a future climate-neutral economy, enabling emission-free transport, heating, and industrial processes as well as inter-seasonal energy storage. Nordic Ecolabelling is positive to the use

[1] European Commission (2018). Renewable Energy Directive (EU) 2018/2001 (RED II). Directive - 2018/2001 - EN - EUR-Lex

[1] European Commission (2023). Renewable Energy Directive (EU) 2023/2413 (REDIII). Directive - EU - 2023/2413 - EN - Renewable Energy Directive - EUR-Lex

of hydrogen for transport. However, the market is still immature, fragmented and dominated by pilot projects with very limited distribution sites in the Nordic countries. Nordic Ecolabelling is following the market and may be included in the product group definition in the future.

- Electrofuels cannot, as in the previous criteria generations, be Nordic Swan Ecolabelled due to many of the same arguments as stated above regarding hydrogen. Electro-fuels are a form of microbial electrosynthesis technology, which uses electricity to convert carbon dioxide emissions into fuels and other useful products. Electro-fuels are very flexible fuels, which is currently mainly made from natural gas, but in many places also of a wide range of renewables such as biomass/biogas, waste, or wind- / solar energy. In the latter way, you can store excess wind energy in e.g., the form of liquid methanol and save electricity for future use. However, this is as for hydrogen associated with high energy consumption, which often includes electrolysis and carbon capture. In order to ensure a clear product definition, Nordic Ecolabelling has therefore chosen to completely exclude electro-fuels in the criteria. As for hydrogen, Nordic Ecolabelling continue to investigate the possibility of involving electro-fuels in upcoming revisions.
- Lubricating oils are not included in the product group since their function is not to provide energy by burning. Liquid fire lighting products and lamp oils are also not covered by the product group, as these are covered by other quality and safety standards that lie outside this product group.

4 How to read this criteria document

Each requirement is marked with the letter O (obligatory requirement) and a number. All requirements must be fulfilled to be awarded a licence.

The text describes how the applicant shall demonstrate fulfilment of each requirement. There are also icons in the text to make this clearer. These icons are:

- Documentation required
- Requirement checked on site

Before a license is issued, the Nordic Ecolabelling organization will normally pay an inspection visit to the applicant and/or the manufacturer. If necessary, multiple inspection visits can be made.

All information submitted to Nordic Ecolabelling is treated confidentially. Suppliers can send documentation directly to Nordic Ecolabelling, and this will also be treated confidentially.

5 Requirements and justification of these

This section presents all the requirements, including the associated documentation requirements. The appendices referred to in the requirements can be found in the end of the criteria document. Background to the requirements, the levels of the requirement, and changes since previous generation are described in the background document.

Definitions

Terms	Definition/Explanation
Additives	Additives are substances added in small amounts to fuels to enhance for example fuel quality, storage stability and engine performance.
Biofuels	Biofuels are liquid and gaseous fuels made from biomass/bio waste and consumed in transport, heating, and industrial purposes.
Biogas	Gaseous fuels based on biomass such as biomethane, compressed biogas (CBG), liquified biogas (LBG) or bio-LPG etc.
Bioliquids	Bioliquids are liquid fuels made from biomass and used to produce electricity, heating, or cooling.
Biomass	Biodegradable fraction of products, waste, and residues from biological origin from agriculture, including vegetal and animal substances, from forestry and related industries, including fisheries and aquaculture, as well as the biodegradable fraction of waste, including industrial and municipal waste of biological origin.
Bio-LPG	Bio-LPG is propane produced from renewable feedstocks; it is also called renewable propane and bio-propane.
Biomass fuels	Biomass fuels are solid or gaseous fuels produced from biomass.
Biomethane	Biomethane is a biogas from which the carbon dioxide, hydrogen sulphide and water have been removed. As a result of the purification process, the biomethane has the same characteristics as natural gas and can be injected into the grid.
CBG	Compressed biogas.
CTO	Crude tall oil
Electro fuels	Electro fuels, also known as e-fuels or synthetic fuels, are a type of drop-in replacement fuel. They are manufactured using captured carbon dioxide or carbon monoxide, together with hydrogen obtained from sustainable electricity sources such as wind, solar and nuclear power.
Energy crops	Energy crops are plants grown specifically to produce energy rather than food or fiber. They are cultivated to be converted into fuels such as bioethanol, biodiesel, biogas, or biomass for electricity and heat.
FAME	A type of biodiesel. FAME=fatty acid methyl ester.
Food and feed crops	Food and feed crops according to the Renewable Energy Directive 2018/2001/EU, as amended by Directive (EU) 2023/2413 means starch-rich crops, sugar crops or oil crops produced on agricultural land as a main crop excluding residues, waste or ligno-cellulosic material and intermediate crops, such as catch crops and cover crops, provided that the use of such intermediate crops does not trigger demand for additional land.
FSC	Forest Stewardship Council.
GHG	Greenhouse Gas.
GWP	Global Warming Potential.

HVO	Hydrotreated vegetable oil is a synthetic diesel that can be produced from vegetable oils, such as rapeseed, forest processing by-products, and animal waste products.
ILUC	Indirect land use change. ILUC can occur when pasture or agricultural land previously destined for food and feed markets is diverted to biofuel production. In this case, food and feed demand still needs to be satisfied, which may lead to the extension of agriculture land into areas with high carbon stock such as forests, wetlands, and peatlands. This implies land use change (by changing such areas into agricultural land) and may cause the release of greenhouse gas emissions (CO2 stored in trees and soil) that negates emission savings from the use of biofuels instead of fossil fuels. The Renewable Energy Directive (RED II/III) aims at phasing out biofuels produced from feedstocks with a high risk of ILUC.
ISCC	International Sustainability and Carbon Certification.
LBG	Liquefied biogas.
LDAR	Leak Detection and Repair.
Non-food cellulosic material	Non-food cellulosic material according to the Renewable Energy Directive 2018/2001/EU, as amended by Directive (EU) 2023/2413 means feedstock mainly composed of cellulose and hemicellulose, and having a lower lignin content than ligno-cellulosic material, including food and feed crop residues, such as straw, stover, husks and shells; grassy energy crops with a low starch content, such as ryegrass, switchgrass, miscanthus, giant cane; cover crops before and after main crops; ley crops; industrial residues, including from food and feed crops after vegetal oils, sugars, starches and protein have been extracted; and material from biowaste, where ley and cover crops are understood to be temporary, short-term sown pastures comprising grass-legume mixture with a low starch content to obtain fodder for livestock and improve soil fertility for obtaining higher yields of arable main crops.
PEFC	Programme for the Endorsement of Forest Certification
UCO	Used cooking oil.
REDII REDIII	Renewable Energy Directive (EU)2018/2001. Renewable Energy Directive (2018/2001/EU), as amended by Directive 2023/2413/EU
Renewable raw materials	Renewable raw materials are in these criteria the same as Biomass, see definition above.
Residues and waste	Residues and waste according to the Renewable Energy Directive 2018/2001/EU, as amended by Directive (EU) 2023/2413 .

5.1 Description of the product

This chapter contains requirements for liquid and gaseous fuels.

O1 Description of the product(s)

The applicant must provide the following information about the product:

- Brand/trading name(s).
- Description of product(s) included in the application, and what kind of transport/heating/industrial purposes the fuel is intended for.
- A description of the technology and the manufacturing process for the production of the renewable fuels (the description must include the entire production chain, from renewable feedstocks to the end product). Subcontractors must be described with

company name, production location, contact person and the production processes used.

- A description of the supply chain for the fuel all the way to the filling station or point of delivery in the case of heating/industrial use. Any joint depot usage or collaboration with regard to deliveries of fuels to filling stations must also be described.
- If an applicant is a reseller of Nordic Swan Ecolabelled fuels, all filling stations and resellers that sell the Nordic Swan Ecolabelled products must be stated.

T̄ Description of the points above. A flow chart is recommended to explain the production process.

Background to O1 Description of the product

The requirement has not changed, compared with version 4 of the criteria. The purpose of the requirement is to provide a satisfactory picture of the life cycle of the fuel: what feedstocks and technology/production processes are used, a description of the supply chain, what kind of transport/heating/industrial purposes the fuel is intended for etc.

Liquid and gaseous fuels can be produced at multiple sites, e.g., refineries or biogas plants. and other similar production facilities. To provide traceability for the Nordic Swan Ecolabelled fuel, all activities must be described. The requirement must thus provide an insight into which product(s) the application is submitted for, in order to ensure correct processing. The requirement for disclosure of all filling stations/resellers that sell the Nordic Swan Ecolabelled fuels makes it possible to test (audit) compliance with renewable fuel volume requirements.

5.2 Resources

This chapter contains requirements for raw materials and composition of raw materials in liquid and gaseous fuels.

O2 Material composition

Liquid fuels

Liquid fuels must be physically segregated and made from 100% biomass defined as waste or residues*.

Non-renewable additives are allowed when technically necessary for fuel performance and must not exceed 3% by volume annually.

** Crude tall oil (CTO) is included in the category of waste/residue if it is a by-product from pulp production.*

Gaseous fuels

Gaseous fuels must be based on 100% biomass defined as residues or waste.

Crops are allowed if they are defined as intermediate crops such as catch crops and cover crops. Non-renewable additives and gases are allowed when technically necessary, for example increasing the calorific value to prepare it for the gas grid. Crops and additives must not exceed 3% by volume annually.

Traceability of biomethane and bio-LPG

- Biomethane: For biogas/biomethane distributed through existing gas grids, it must be documented that the quantity of biogas injected into the gas grid is equal to the quantity of gas extracted from the grid on an annual basis. This is annually validated through a documented traceability scheme reviewed by an external auditor, for details see appendix 1.
- Bio-LPG: When bio-LPG is mixed with fossil LPG, it must be documented that the quantity of bio-LPG sold, is equal to the quantity of bio-LPG injected in the system. A mass balance-based traceability method is accepted[2], see appendix 1. Trade in certificates, so called Book and claim[3] is not accepted.

- Calculation and documentation showing compliance with material composition.
- Crude tall oil: Verification that the crude tall oil comes from pulp production.
- Biomethane and Bio-LPG: A copy of a certificate or statement from an external auditor showing compliance with traceability requirements.

Background to O2 Material composition

Raw material use for liquid and gaseous biofuels has high environmental relevance, as production relies largely on agricultural and forest biomass that directly affects land use, ecosystems, biodiversity, and natural resources.[4] Feedstocks include both virgin materials and residues/waste streams from agriculture, forestry, municipalities, households, retail, and food industries. Biofuels are commonly classified as first-generation (derived from high-value plant components such as sugar, maize, cereals, and grass) and advanced/second-generation biofuels (based on residues from primary production such as straw, bagasse, other lignocellulosic materials, and livestock waste, as defined in the Renewable Energy Directive (2018/2001/EU), as amended by Directive 2023/2413/EU .[5, 6] Environmental relevance is primarily linked to land use and ecosystem impacts. Cultivation of biomass requires land, water, fertilizers, and pesticides and may contribute to soil degradation, biodiversity loss, and pressure on local communities.[7, 8] Use of land for energy crops can compete with food production and may drive direct and indirect land-use change, potentially increasing greenhouse gas emissions.[9] Forest biomass sourcing is also environmentally significant, as forest resources are limited, and unsustainable harvesting may lead to carbon stock losses, habitat degradation, and long recovery times.[10]

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[2] According to the mass balance method of verifying compliance, there is a physical link between the production and the consumption of biofuels.
[3] Book and claim imply that there is no physical connection between the sustainability claim (biological origin) and the product (gas).
[4] IPCC (2023). *AR6 Climate Change Mitigation Report*. AR6 Synthesis Report: Climate Change 2023
[5] IEA Bioenergy (2017). *Biofuels and sustainability*. IEA Bioenergy - Annual Report 2017
[6] European Commission (2018). *Renewable Energy Directive (EU) 2018/2001 (RED II)*. Directive - 2018/2001 - EN - EUR-Lex
[7] FAO (2021). *The State of the World's Land and Water Resources*. The State of the World's Land and Water Resources for Food and Agriculture – Systems at breaking point (SOLAW 2021)
[8] IPBES (2019). *Global Assessment Report on Biodiversity and Ecosystem Services*. Global Assessment Report on Biodiversity and Ecosystem Services | IPBES secretariat
[9] European Commission (2015). *The land use change impact of biofuels consumed in the EU*. The land use change impact of biofuels consumed in the EU - Energy
[10] IPCC (2023). *AR6 Climate Change Mitigation Report*. AR6 Synthesis Report: Climate Change 2023

In the European Union as a whole, approximately 55% of biodiesel feedstocks in 2024 were derived from waste and residues, while around 39% remained crop-based[11]. By comparison, Norway reported a significantly lower share of conventional biodiesel produced from food and feed crops. In 2024, only approximately 14–15% of Norwegian biodiesel consumption was classified as conventional biofuel, while roughly 85% originated from waste- and residue-based sources, particularly used cooking oil (UCO), animal fats, and forestry-related residues. [12] The Nordics are among the global leaders in biofuel deployment, with biofuels accounting for roughly 20–30% of road transport energy use in Sweden. However, not all volumes are fully waste-based, and feedstock availability remains a key constraint which make the potential of this requirement medium to high.[13] In conclusion there is still significant room for improvement by steering towards waste and residue as raw material.

Due to this, Nordic Swan Ecolabel liquid and gaseous fuels should from an environmental perspective be produced from biomass defined as waste and residue resources. Using waste and residues as feedstocks avoids the land-use issues associated with food-, feed- and energy crops. This requirement aims at reducing the use of non-renewable additives and steer towards the use of waste and residue based raw materials.

The threshold limits for additives of non-renewable origin have been tightened compared to generation 4 of the criteria. Additives of non-renewable origin, that are added only for technical reasons, were previously allowed up to 10% by volume annually in the total amount of liquid fuel. Generation 5 of the criteria lowers this limit to 3%, based on data demonstrating that such a level is achievable. Several blends of fuels on the market do not fulfil this requirement but Nordic Swan Ecolabel wish to steer towards fuels that are 100% renewable. This means that fuels such as HVO100 can fulfil the criteria, since the necessary additives do not exceed 3%. E85 does not fulfil the requirement since there may be more than 3% non-renewable additives. A product such as HVO97 (97% HVO and 3% diesel), would not fulfil the requirement since the fossil diesel is not necessary for technical reasons. Up to 3% of additives and gases is permitted in biogas to increase the calorific value and prepare it for the existing gas grid.

In generation 5, liquid fuels must be physically segregated and made from 100% biomass that are defined as waste or residues. As a result, neither fossil feedstocks nor renewable feedstocks that are *not* defined as waste/residues can be included in the fuel.

It is permitted to use mass balances for the traceability on the Nordic Swan Ecolabelled biogas. National approved traceability systems (for example Energinet in Denmark) are required for gaseous fuels distributed through existing gas grids. It must be documented that the quantity of gas injected into the gas grid is equal to the quantity of gas extracted from the grid on an annual basis. A documented traceability scheme reviewed by an external auditor is alternatively acceptable.

Tall oil is mainly produced from softwood coniferous trees, such as spruce and pine, due to the chemical composition of these species. Softwood grown in plantations, such as Pinus radiata, can be used to produce tall oil, but they typically yield lower amounts compared to slower-growing conifers like Scots pine. As tall oil is a by-product of the kraft pulp process,

[11] EBB Statistical Report 2024, EBB Statistical Report 2024
[12] https://www.miljodirektoratet.no/aktuelt/nyheter/2025/juni/framleis-auka-bruk-av-biodrivstoff-i-2024/
[13] Technology Collaboration Programme on Advanced Motor fuels, IEA-AMF, AMF

its production is closely linked to the geography of the softwood kraft pulp industry and is therefore concentrated mainly in North America and Northern Europe.

Crude tall oil, CTO, is generally classified as a by-product of kraft pulp process. From a forest resource perspective, tall oil as a by-product is considered low risk and is therefore approved as a waste/residue feedstock by Nordic Ecolabelling under this requirement. ISCC, PEFC and FSC are examples of certification schemes that can cover tall oil but since supply is limited for fuel use, Nordic Ecolabelling do not require a certification scheme for tall oil.

Important to note is the exemption only includes tall oil that originates from pulp manufacturing. The term “tall oil” may also refer to oils produced from other feedstocks, primarily for use in the chemical industry, which are not covered by this exemption.

O3 Raw materials not allowed to use

The following raw materials must not be used in Nordic Swan Ecolabelled liquid and gaseous fuels:

- Food- and feed crops.
- Palm oil and soybean oil and their derivatives (including PFAD and other residues) are prohibited, irrespective of their classification under the Renewable Energy Directive.

Additional requirement for Nordic Swan Ecolabelled gaseous fuels:

- Energy crops must not be used.

The requirement does not cover feedstock defined as non-food cellulosic material or residues and waste product generated form the cultivation of food- and feed crops.

The requirement does not cover residues and waste products generated by households or commercial, industrial- or institutional facilities in their role as end-users of a product that can no longer be used for its intended purpose.

- The applicant shall provide a declaration of compliance with the requirement concerning renewable feedstocks from palm oil and soybean oil. Appendix 2 may be used. Nordic Ecolabelling reserves the right to require further documentation in the event of uncertainty about fulfilment of the requirement.
- The applicant shall provide a declaration of compliance with the requirement concerning no use of food- or feed crops in the production of biofuels. Appendix 2 may be used.

Background to requirement O3 Raw materials not allowed to use

Biomass is a limited resource that cannot meet all our energy requirements. The capacity of the planet to produce biomass is limited by its biophysical boundaries. The challenge is, therefore, the competition of land between food, feed, and fuel. About 40% of all global cropland is currently used to produce high quality feeds, some of which are cereals which humans could also consume resulting in feed-food competition[14]. Around 30% of the global

[14] A. Mottet, C. de Haan, A. Falcucci, G. Tempio, C. Opio, P. Gerber. Livestock: on our plates or eating at our table? A new analysis of the feed/food debate, 2017

cropland dedicated to cereals is used to grow livestock feed[15]. Currently, about 13% of global cropland is used to produce biofuels and textiles[16].

In the European Union as a whole, approximately 55% of biodiesel feedstocks in 2024 were derived from waste and residues, while around 39% remained crop-based[17]. By comparison, Norway reported a significantly lower share of conventional biodiesel produced from food and feed crops. In 2024, only approximately 14–15% of Norwegian biodiesel consumption was classified as conventional biofuel, while roughly 85% originated from waste- and residue-based sources, particularly used cooking oil (UCO), animal fats, and forestry-related residues. [18] In conclusion there is still significant room for improvement by limiting the use of food and feed crops.

Nordic Swan Ecolabelling would like to limit the use of biofuels from food-, feed and energy crops and are therefore banning the use of food- and feed crops in the production of Ecolabelled liquid and gaseous fuels. This means that Ecolabelled liquid and gaseous fuels can be produced from e.g., ligno-cellulosic material, non-food cellulosic materials or residues and waste. Furthermore, energy crops are not allowed in Nordic Swan Ecolabelled gaseous fuels.

It is only allowed to use raw materials defined as residues and waste according to Renewable Energy Directive (2018/2001/EU), as amended by Directive 2023/2413/EU[19, 20]. Food- or energy crops are used in varying amounts in the production of biogas in Scandinavia/Europe, but the volumes are declining due to a wish to move biogas production away from crops that can be used for food to processing waste. In Denmark legislation limits the use of energy crops to maximum 4%[21]. An analysis ordered by Energistyrelsen in Denmark has however concluded that larger biogas facilities should be able to stop the use in 2030[22]. Several other European countries such as Germany, and France have introduced strict subsidies legislation regarding use of energy crops[23]. Crops affected mainly include food varieties such as corn and beets. Based on the findings, energy crops are not allowed in the production of Nordic Swan Ecolabel gaseous fuels.

Palm oil and soy are regarded as food and feed crops and can therefore not be used in a Nordic Swan Ecolabel fuel. Oil palm- and soy plantations are often established at the cost of tropical rainforest and other areas of high conservation value[24]. It is one of the greatest threats to biodiversity in South-East Asia and South America, causing loss of valuable species, habitats, ecosystems, and landscapes. The clearing of forests also leads to emission of greenhouse gases. Local communities experience social consequences like land use conflicts, little or no compensation and loss of livelihood.

[15] https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/livestock-feeds (visited April 2022)
[16] J. Porre, T. Nemecek: Reducing food´s environmental impacts through producers and consumers, 2018
[17] EBB Statistical Report 2024, EBB Statistical Report 2024
[18] https://www.miljodirektoratet.no/aktuelt/nyheter/2025/juni/framleis-auka-bruk-av-biodrivstoff-i-2024/
[19] IEA Bioenergy (2017). *Biofuels and sustainability*. IEA Bioenergy - Annual Report 2017
[20] European Commission (2018). *Renewable Energy Directive (EU) 2018/2001 (RED II)*. Directive - 2018/2001 - EN - EUR-Lex
[21] Aftale om nye krav for anvendelse af energiafgrøder til produktion af biogas af 30. juni 2021
[22] Energiafgrødeanalysen, SDU, Rapport udarbejdet for Energistyrelsen, Januar 2020
[23] https://www.europeanbiogas.eu/, visited March 2022
[24] FAOSTAT 2019

The requirement also prohibits by-products, residues and waste fractions from palm and soybean oil industries (e.g., Palm Fatty Acid Distillate: PFAD, Palm Effluent Sludge: PES and soybean meal) because they are considered making palm oil and soy production more profitable and therefore connected to the same environmental and social burdens. In Sweden, Norway and Denmark PFAD is already classified as a raw material with a high ILUC (indirect land use change) risk. In Finland PFAD is classified as a residual product without a high ILUC risk. Due to the classification PFAD is used as a raw material of liquid and gaseous fuels in Finland. Nordic Swan Ecolabelling has the possibility to ban the use of PFAD and therefore only support the use of sustainable raw materials.

In general, the Nordic Swan Ecolabel supports substitution of fossil fuels with sustainable renewable raw materials. However, with increasing production and demand, the potential for producing palm oil and soy sustainably is limited. For that reason, palm oil and soy should only be used in products where a sustainable alternative is difficult to find, and it should be certified with a credible standard. Nordic Ecolabelling's team of renewable material experts has reviewed the standards for palm oil (RSPO[25]) and soy (RTRS[26]). It has concluded that neither of the standards currently meet Nordic Ecolabelling's labelling scheme requirements. This is mainly due to a lack of absolute requirements for the protection of key biological areas, and a lack of requirements for compliance with the basic international conventions. This means that Nordic Ecolabelling prohibits the use of these feedstocks in Nordic Swan Ecolabelled liquid and gaseous fuels, even if they are certified.

O4 Used cooking oil (UCO)

This requirement applies when used cooking oil (UCO) is used as a raw material to produce the fuel.

The licensee must have procedures in place to ensure that no virgin palm oil is included in the UCO. The licensee must verify that the UCO is genuine used cooking oil, including traceability routines and testing of ester and cardanol content:

- Ester content: Maximum 1% (m/m) according to test method EN 14103:2020
- Cardanol content: Maximum 0,1% (m/m) according to a gas chromatography-mass spectrometry (GC-MS) method

Sampling and testing must be performed on each batch/tank and must comply with the requirements in appendix 4.

- Description and documentation of the implemented routines, including how compliance with appendix 4 is ensured.
- Test results for ester and cardanol content.

Background to requirement O4 Used cooking oil (UCO)

New requirement. Used cooking oil, UCO, is oil that has been previously used for cooking or food preparation, typically collected from restaurants, food manufacturers, and households. Instead of being discarded, UCO can be recycled and processed into products such as biodiesel and sustainable aviation fuel.[27] Because it is a waste-based feedstock, UCO is

[25] http://www.rspo.org/
[26] http://www.responsiblesoy.org/en/
[27] EWABA | European Waste-based & Advanced Biofuels Association

considered more environmentally sustainable than virgin vegetable oils, such as virgin palm oil, which is linked to deforestation, habitat destruction, and high greenhouse gas emissions.

Fraud involving virgin palm oil being mixed into UCO is a growing concern in the biofuel industry. When virgin palm oil is falsely sold as UCO or mixed into batches of UCO, it undermines climate targets, distorts the market, and allows unsustainable palm oil to benefit from incentives intended for recycled waste materials. This type of fraud also makes it difficult to ensure transparency and traceability throughout the supply chain. There is a great potential for improvements in the industry today as there are currently limited standardized ways to manage these frauds. The European commission has introduced stricter requirements on imported UCO, with start from 2027.[28] However, one of the main problems with UCO is linked to the use of mass balance systems and the lack of on-site audits where the UCO is generated. In many cases, the system relies heavily on self-declaration. This creates strong incentives for fraud, since there is a risk that the UCO is double counted under the Renewable Energy Directive (2018/2001/EU), as amended by Directive 2023/2413/EU, [29, 30] and that it gets a higher market value.

Nordic Swan Ecolabel requires that all UCO used as a feedstock for liquid or gaseous fuels is tested to reduce the risk of fraud involving virgin palm oil and UCO. Test Method EN 14103:2020 (MOD) is used to analyse ester content. The test helps verify that the material is not virgin oil, as an ester profile that is too “pure” or closely resembles fresh vegetable oil may indicate that the raw material is not exclusively derived from used cooking oil. Test Method GC-MS is used to analyse cardanol content. The test helps identify whether other non-permitted materials have been mixed into the feedstock. The presence of cardanol or other markers associated with technical oils may indicate contamination or non-permitted origin, meaning that the material cannot be classified as UCO.

Worth mentioning is that this requirement cannot fully guarantee that UCO is 100% free from virgin palm oil. For example, small amounts of virgin oil blended into UCO may still pass chemical testing. While these controls reduce the risk of fraud, Nordic Ecolabelling cannot guarantee that the UCO is entirely free from virgin palm oil.

O5 Genetically modified plants

Raw materials used in Nordic Swan Ecolabelled fuels must not be genetically modified*.

** Genetically modified organisms are defined in EU Directive 2001/18.*

This requirement does not include residuals or waste defined according to the Renewable Energy Directive 2018/2001/EU, as amended by Directive (EU) 2023/2413 , however not by-products, residues and waste fractions from palm and soybean oil industries (e.g., Palm Fatty Acid Distillate: PFAD, Palm Effluent Sludge: PES and soybean meal).

- Declaration from the raw material supplier of compliance with the requirement. Appendix 3 may be used.

[28] https://www.resourcewise.com/blog/eu-tightens-rules-on-uco-imports-implications-for-the-biofuels-market
[29] IEA Bioenergy (2017). *Biofuels and sustainability*. IEA Bioenergy - Annual Report 2017
[30] European Commission (2018). *Renewable Energy Directive (EU) 2018/2001 (RED II)*. Directive - 2018/2001 - EN - EUR-Lex

Background to requirement O5 Genetically modified plants

Genetically modified organisms (GMOs) are highly controversial. Topics that are discussed include food security, land use, lack of scientific knowledge about long-term effects and effects under local agricultural/forest conditions and risk of adverse effects on health and the environment.[31],[32],[33],[34] Four GM crops dominate: soybean, cotton, maize, and rapeseed. The dominating traits are resistance to one or several herbicides and production of one or several insecticidal proteins or a combination of the two. Research has not clearly shown that GMOs contribute to development towards sustainable agriculture with less use of pesticides. Problems include herbicide resistant weeds due to GM agricultural practises, resistance among target insect pests and gene flow from GM plants to agricultural or wild relatives. Research shows conflicting results on performance and environmental effects of GMOs, especially on yield and non-target organisms. There are knowledge gaps on effects on microorganisms in the soil and aquatic organisms, GMOs with combined traits, socioeconomic consequences, and risks in an ecosystem perspective.

Nordic Ecolabelling emphasizes the precautionary principle and discourages the use of GMOs that are commercially available today. Nordic Ecolabelling is concerned about the consequences when genetically modified plants, animals and microorganisms are propagated in nature. However, Nordic Ecolabelling is not against genetic engineering or GMOs as such, and we believe that GMOs should be assessed on a case-by-case basis. We promote a holistic approach to GMOs and assess sustainability, ethics, and benefit to society as well as possible risks to health and the environment. We believe that GMOs made with new gene editing techniques should be assessed according to the same guidelines as other GMOs, which is in line with EU regulations.

O6 Traceability and control of vegetable and animal feedstocks

This requirement applies to licensees in countries that are not EU Member States, where Directive (EU) 2018/2001 as amended by Directive (EU) 2023/2413 has not yet been incorporated into national legislation. In such cases, the applicant must document compliance with the sustainability and traceability requirements corresponding to Article 29 and Article 30 of the Directive, using an EC-recognised voluntary certification scheme or equivalent independent third-party verification. Once the Directive has been incorporated into the EEA Agreement and implemented nationally, compliance with national implementation is considered sufficient.

- Documentation/declaration from the body that has inspected and approved compliance with the Renewable Energy Directive (EU) 2018/2001, as amended by Directive (EU) 2023/2413. Nordic Ecolabelling reserves the right to require the submission of further documentation in the event of uncertainty about whether the raw material originated in areas with a high biodiversity value or areas with a high carbon stock.

[31] Catacora-Vargas G (2011): Genetically Modified Organisms – A Summary of Potential Adverse Effects Relevant to Sustainable Development. Biosafety Report 2011/02, GenØk – Centre for Biosafety
[32] Kolseth et al (2015) Influence of genetically modified organisms on agro-ecosystem processes. Agriculture, Ecosystems and Environment. 214 (2015) 96–106
[33] Fischer et al. (2015) Fischer et al. (2015): Social impacts of GM crops in agriculture: a systematic literature review. Sustainability 7:7
[34] Catacora-Vargas G et al. (2018): Socio-economic research on genetically modified crops: a study of the literature. Agriculture and Human Values 35:2

Background to requirement O6 Traceability and control of vegetable and animal feedstocks

The requirement has been changed and now only applies to licensees in countries that are not EU Member States, where Directive (EU) 2018/2001 as amended by Directive (EU) 2023/2413 has not yet been incorporated into national legislation.

The previous requirement in generation 4 were strongly related to Renewable Energy Directive (2018/2001/EC) known as RED II. The RED II defines a series of sustainability and GHG emission criteria that bioliquids used in transport, heating and cooling must comply with to be counted towards the overall EU target and to be eligible for financial support by public authorities. In particular, the RED II introduced sustainability for forestry feedstocks, feedstocks from indirect land use change (ILUC) as well as GHG criteria for solid and gaseous biomass fuels.

It was relevant to include this requirement in the previous generation (gen. 4) for all licensees due to a few traceability gaps in RED II. However, since EU updated the Directive (EU) 2023/2413, known as REDIII, the rules are more strict and more comprehensive when it comes to traceability. External analyses and compliance guidance consistently describe REDIII as a qualitative step change in traceability requirements. For example, traceability is a binding enforceable requirement under RED III where chain-of-custody and mass-balance systems are no longer “best practice” but a legal requirement, and all actors in the value chain must be able to document the link between the physical product, sustainability status, and GHG data. Furthermore, certified batch-level traceability is mandatory, where REDIII requires batch-level documentation supported by Proof of Sustainability (PoS), mass-balance statements and compliance is only achievable via recognized third-party schemes. In practice, compliance requires using EU-recognized certification schemes[35] (e.g., ISCC EU, RSB, REDcert). Due to this, RED III somewhat closes the practical traceability gap that existed under RED II by turning traceability from an indirect support mechanism into a strict, end-to-end, auditable condition for market eligibility. RED III are now based on EU recognized certification schemes meaning that the additional value of requiring these schemes is no longer present. In addition, one of the biggest concerns is the problems related to UCO, which instead are handled in the new requirement O4.

Since all EU Member States must follow Directive (EU) 2018/2001 as amended by Directive (EU) 2023/2413, Nordic Ecolabelling no longer se any additional value to have this requirement for those countries. However, for all countries that are not an EU Member state, for example Norway and Iceland, it is still relevant to require this information since traceability and control of vegetable feedstocks is important to the credibility of the Nordic Swan Ecolabel. A chain of custody from the feedstock producer to the fuel supplier must be established for sustainability disclosures through the supply chain. By setting the requirement that imported feedstocks must be certified by one of the European Commission’s approved certification schemes for documentation of the EU’s sustainability criteria, Nordic Ecolabelling ensures that the applicant's production process is independently audited. Nationally produced renewable feedstocks must meet national legislation, i.e., national implementation of the Renewable Energy Directive.

[35] Voluntary schemes

Once the Directive has been incorporated into the EEA Agreement and implemented nationally, compliance with national implementation is considered sufficient.

5.3 Greenhouse gas emission savings

This chapter contains requirements for greenhouse gas emission savings for gaseous and liquid fuels.

O7 Reduction of greenhouse gases

Table 2 Requirement levels for liquid respectively gaseous fuels.

Reduction of GHG-emissions in the entire production chain	
Liquid fuels	85 %
Gaseous fuels (and liquified biogas)	90 %

Calculations of greenhouse gas emission savings must follow the principles of Article 31 of the Renewable Energy Directive (2018/2001/EU), as amended by Directive 2023/2413/EU with methodological rules set out in Annex V. The fossil fuel comparator EF(t) is 94 g CO2eq/MJ. The calculations must be performed either by a competent third party or by the applicant. When calculations are carried out by the applicant, they must be verified and approved by a competent third party.

Rules and default values for calculating greenhouse gas emissions reductions must comply with the applicable national regulations in each Nordic country or, where a biofuel component is certified under one of the European Commission's voluntary certification schemes, with the rules and default values established under Directive (EU) 2018/2001, as amended by Directive (EU) 2023/2413, including the methodological requirements of Article 31 and Annex V. Default value (conversion factors): refer to the data that is required to convert input values (stated in kg, kWh, etc.) into greenhouse gas emissions.

If the Nordic Swan Ecolabelled fuel is a blend of several components or components from different suppliers, the greenhouse gas emissions must be a weighted average of the constituent renewable components.

t̄ Calculation and documentation showing that the requirement is met. Calculations must be based on data from at least 12 months at the time of application. Document showing that the data and calculations have been reviewed and approved by an independent third party.

Background to requirement O7 Reduction of greenhouse gases

Energy use and associated climate impact have high environmental relevance for the production and use of renewable liquid and gaseous fuels, as greenhouse gas (GHG) emissions occur throughout the life cycle, including feedstock production, processing, transport, and combustion. Both renewable and fossil fuels emit GHG when combusted and therefore contribute to the greenhouse effect. However, fossil fuels introduce additional carbon to the atmosphere, while CO_2 from sustainably sourced biomass can be reabsorbed

through regrowth.[36,37] Consequently, fossil CO_2 has long-term climate effects lasting centuries to millennia, whereas biogenic CO_2 generally has a shorter climate impact, provided that biomass is sourced sustainably and does not cause significant land-use change or carbon stock losses.

There is high potential to reduce climate impact by prioritising renewable fuels with high verified GHG emission savings compared with corresponding fossil fuels. The European Union's Renewable Energy Directive (EU) 2018/2001, as amended by Directive (EU) 2023/2413 (REDIII) [38,39] establishes minimum GHG reduction thresholds and sustainability criteria for biofuels, creating a strong framework for climate performance improvements.

The threshold limits for reduction of greenhouse gases have been tightened compared to generation 4 of the criteria. For biogas a minimum requirement of 90% reduction of greenhouse gas emissions is stricter than REDIII, which sets requirements up to 80% for biogas used for electricity or heating purposes. For liquid fuels a minimum requirement of 85% is stricter than REDIII, which sets requirements at 65% GHG-reduction for liquid fuels for transport. Furthermore, dialogue with the industry has confirmed that this is an ambitious but achievable level.

Nordic Ecolabelling is aware that especially wastewater treatments plants of an older date, may have difficulties in complying which the requirement. Production of biogas from wastewater is favourably both from an environmental and circular economy perspective. However, Nordic Ecolabelling encourages these plants to implement measures that decrease the overall climate impact.

Calculation and documentation for the requirement must be based on data from at least 12 months at the time of application. The specific period is agreed upon individually at the time of application, as it may depend on ongoing certification under one of the EU certification systems. Nordic Ecolabelling, however, requires documentation to be submitted when data is available for a year.

O8 Control of methane leakage from biogas production

When producing biogas the licensee must implement one of the following options (A or B) for measuring and reducing methane leakage from the biogas production plant and upgrading facility.

A) Real-time monitoring system in the most relevant process units including

- continuous monitoring enabling identification of leakage
- specified detection limits and automatic alarms
- an action plan to identify, prevent and repair leaks without undue delay

[36] IPCC (2021). Sixth Assessment Report, Working Group I: The Physical Science Basis. Climate Change 2021: The Physical Science Basis | Climate Change 2021: The Physical Science Basis
[37] IEA Bioenergy (2023). How bioenergy contributes to a sustainable future IEA_BIOENERGY_REPORT.pdf
[38] European Commission (2018). *Renewable Energy Directive (EU) 2018/2001 (RED II)*. Directive - 2018/2001 - EN - EUR-Lex
[39] European Commission (2023). Renewable Energy Directive (EU) 2023/2413 (REDIII). Directive - EU - 2023/2413 - EN - Renewable Energy Directive - EUR-Lex

B) Leak Detection and Repair (LDAR) Programme

- An annual risk assessment shall be carried out to identify potential sources of methane leaks
- An annual leak inspection of gas-bearing components shall be carried out using a handheld methane detector (sniffing) or optical gas imaging (OGI) cameras. The focus should be on identified risk areas and gas-handling equipment
- The results of inspections and observations shall be documented. LDAR must be part of the maintenance plan.
- Identified leaks shall be repaired without undue delay

For additional guidance of LDAR programme World's Biogas Association's Operational Guidance note: Leak Detection and Repair[40] may be followed.

- Description of the real-time monitoring system or Leak Detection and Repair (LDAR) Programme

Background to requirement O8 Control of methane leakage from biogas production

Biogas consists of about 70% methane, 30% carbon dioxide and other gases such as hydrogen and hydrogen sulphide.[41] Methane is a potent greenhouse gas with a global warming potential (GWP100) of approximately 27–30 relative to CO_2 according to IPCC (Intergovernmental Panel on Climate Change) sixth assessment report (AR6). Methane leakage from the biogas plant, and from biogas upgrading, therefore has great impact on the total balance of GHG reductions for the production.

A Danish Energy Agency study revealed a leak rate of 2.5% from biogas production.[42] This poses an unnecessary climate impact that significantly affects the total climate effect of the biogas production, due to the high GWP of methane. Methane leakage can occur both in anaerobic digestion plants, and at upgrading facilities. Emissions occur from ventilation, overflow drain, biofertilizer storage etc. Usually, the biofertilizer storage contribute to highest leakage at the biogas plant. At the upgrading facility methane may occur in the outgoing residual gas[43]. These leaks could be significantly mitigated through the implementation of appropriate procedures.

The requirement on reduction of greenhouse gas emission, sets a cap on total life cycle emissions, where methane leakage is included in the calculation. However, it is still possible to use average values for leakage in the required calculation. By this requirement Nordic Ecolabelling ensures that a biogas plant operator works systematically with reducing the methane leakage by detection and quantification.

The requirement has been strengthened compared to previous generation by now requiring a real-time monitoring system alternatively an LDAR program for avoiding and reducing the risk of methane leakage from biogas production. Previous generation 4 required routines with regular leak detections and quantification every third year.

[40] https://www.worldbiogasassociation.org/wp-content/uploads/2025/09/WBA_OperationalGuidanceNote_PollutantGases_LeakDetectionRepair_v1.pdf
[41] https://bureau-industrial-transformation.jrc.ec.europa.eu/sites/default/files/2019-11/JRC113018_WT_Bref.pdf
[42] https://www.globalmethane.org/case-studies/library/details.aspx?id=20
[43] 2016-17-handbok_metanmatning.pdf (svensktvatten.se)

Option A is inspired by advanced methane management frameworks, such as OGMP 2.0 (Oil & Gas Methane Partnership) by UN Environmental Programme and Climate & Clean Air Coalition, developed for high-emission risk sectors. Real-time monitoring is intended as a best-practice measure for the most relevant process units, going beyond regulatory minimum requirements to provide enhanced transparency and rapid response capability.

Option B) is based on the Best Available Techniques (BAT) Conclusions for Waste Treatment ((EU) 2018/1147), which identify leak detection and repair as a BAT for the control of diffuse emissions. LDAR is usually implemented in a risk-based way, i.e. plants with high-integrity equipment require less stringent LDAR application. An LDAR programme usually includes two fundamental steps: identification of the leaking components and repair of these leaks to minimise losses. For the identification of leaks there are currently two available methods: sniffing (described by EN 15446) and optical gas imaging (OGI).

As a result of the EU Green deal and the EU Commission's communication of the methane strategy, the legislation regarding methane emissions from biogas plants will probably be tightened in the future.[44]

5.4 Quality requirements

This chapter covers the quality requirements for liquid and gaseous fuels for transport (road, sea, and air), heating and industrial purposes.

O9 Quality specifications

The requirement applies to the final product.

Liquid fuels for road transport* must meet a relevant fuel standard and the fuel quality Directive (2009/30/EC) established by the EU.

** The fuel quality standard (2009/30/EC) also covers off-road machinery, such as forestry and agricultural machinery.*

Fuels for maritime shipping must meet the requirements of:

- ISO 8217:2024 standard, or
- FAME: ASTM D6751 or EN 14214 or
- HVO: ASTM D975 or EN 15940:2023
- All fuels for maritime shipping must comply with the European Union's Sulphur Directive (2012/33/EC).

Fuels for air transport must meet the requirements of:

- ASTM D7566 standard or ASTM D1655

Liquid fuels for heating and industrial purposes must meet the requirements of the 14214:2012+A2:2019 (biodiesel), the EN15376:2014 (ethanol) or the EN 15940:2023 (HVO) standards.

Liquified Petroleum Gases (Bio-LPG) must meet the requirements of ISO 9162:2018[45] or ASTM 1835. Bio-LPG used in vehicles must meet EN589:2024.

[44] https://www.svensktvatten.se/vattentjanster/avlopp-och-miljo/slam-och-biogas/egenkontroll-metanemissioner/
[45] Apply to international transfers of commercial propane and commercial butane.

Biogas for transport/heating/industrial use distributed on existing gas networks must be upgraded and meet the quality criteria of the national inspection authority for the gas grid, or the equivalent quality requirements from the body responsible for operating the natural gas grid system.

If a licensee can demonstrate that the end user of the liquid or gaseous fuel accepts a different fuel quality than those specified in the requirement, the licensee may, following approval by Nordic Ecolabelling, be allowed to use the Nordic Swan Ecolabel without meeting specified fuel standards. Biogas must at least be purified from; water, hydrogen sulphide, nitrogen, oxygen, ammonia, and siloxane particles.

The requirements concerning test laboratories and test instructions are stated in Appendix 4.

Liquid and gaseous fuels:

- The applicant must indicate which standard the liquid or gaseous fuel is compliant with.
- An analysis report and a declaration from the test laboratory verifying compliance with the fuel standard. Alternatively, a written statement from the end user of the fuel in which it is clearly stated that the end user accepts that the fuel does not need to comply with the above standards. Biogas must at least be purified from; water, hydrogen sulphide, nitrogen, oxygen, ammonia, and siloxane particles.

Biogas distributed on existing gas networks

- A declaration from the national inspection authority for the gas grid stating that the biogas is compliant with the gas quality requirements for the gas grid or from the body responsible for operating the natural gas grid system.

Background to requirement O9 Quality specifications for liquid and gaseous fuels

The requirement has been adjusted to relevant updated fuel quality standards.

Biogas for transport/heating/industrial use distributed on existing gas networks must be upgraded and meet the quality criteria of the national inspection authority for the gas grid, or the equivalent quality requirements from the body responsible for operating the natural gas grid system.

Nordic Ecolabelling requires the Nordic Swan Ecolabelled liquid fuels to meet recognized fuel standards to guarantee the quality. However, if a licensee can demonstrate that the end user of the liquid or gaseous fuel accepts a different fuel quality than those specified in the requirement, the licensee may, following approval by Nordic Ecolabelling, be allowed to use the Nordic Swan Ecolabel without meeting specified fuel standards.

5.5 License maintenance

The purpose of the licence maintenance is to ensure that fundamental quality assurance is dealt with appropriately.

O10 Customer complaints

The licensee must guarantee that the quality of the Nordic Swan Ecolabelled fuel does not deteriorate during the validity period of the licence. Therefore, the licensee must keep an archive over customer complaints.

Note that the original routine must be in one Nordic language or in English.

- Upload your company's routine for handling and archiving customer complaints.

Background to requirement O10 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.

O11 Traceability

The licensee must be able to trace the Nordic Swan Ecolabelled liquid and gaseous fuels in the production based on volume (input-output). The licensee must also be able to verify that the manufactured/sold product corresponds to the physical Nordic Swan Ecolabelled fuel. In addition, it should be possible to connect the product with the actual raw material used.

You can upload your company's routine or a description of the actions to ensure traceability in your company.

- Please upload your routine or a description.

Background to requirement O11 Traceability

This requirement has been revised to better reflect the practical conditions for liquid and gaseous compared to previous generations.

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.

O12 Follow-up of license

The licensee shall ensure that the requirements of the criteria are met during the validity period of the license. At least once a year (within 6 months of closing the books) a review of operations shall be made covering at least the following areas:

- Material composition, requirement O2
- Reduction of greenhouse gasses, requirement O7

The review (report) must be audited and approved by independent third parties.

Nordic Ecolabelling may request reports from the internal reviews and examine a selection, or all, of the requirements. Information on a compliance check is given in advance.

t̄ Documentation, verified and approved by independent third party, which verifies that the Nordic Swan Ecolabelled fuel complies with the material composition (requirement O2) as well as requirements for greenhouse gas emissions reduction (O7) in the last year.

Background to requirement O12 Follow-up license

The requirement concerning follow-up of license are unchanged, compared with generation 3 of the criteria. The possibility of changing the composition of feedstock in the Nordic Swan ecolabelled fuel underscores the need for annual documentation to meet the requirement for both use of raw materials and hence the calculation of emission of greenhouse gasses. The documentation must be audited an approved by independent third parties.

6 Environmental impact of liquid and gaseous fuels

The relevant environmental impacts found in the life cycle of liquid and gaseous fuels are set out in the MECO scheme below. A MECO describes the key areas that have impact on the environment and health throughout the life cycle of the product, including consumption of materials/resources (M), energy (E), chemicals (C) and other impact areas (O). This MECO analysis was performed in conjunction with Nordic Ecolabelling's evaluation of the criteria in 2026. The MECO analyses are based on LCA studies and scientific reports.[46,47,48,49,50,51,52,53,54,55]

Nordic Ecolabelling sets requirements concerning the topics and processes in the life cycle that have a high environmental impact, also called hotspots. Based on the MECO analysis, an RPS tool is used to identify where ecolabelling can have the greatest effect. 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.

The product group liquid and gaseous fuels includes liquid and gaseous fuels used for transport (road, air, and maritime), as well as for heating and industrial purposes. While the materials and production processes vary widely, they share a uniform function: to generate energy through combustion in engines or boilers.

Since fossil fuels (e.g. conventional diesel, petrol, and natural gas) are still widely available on the market, Nordic Ecolabelling has assessed the criteria from two perspectives: comparing Nordic Swan Ecolabelled fuels with fossil fuels and comparing them with other fuels of renewable origin. The environmental potential and impact of the criteria vary depending on the comparison.

[46] Börjesson et al. / Swedish Life Cycle Center (2022). Climate impact of transport fuels https://www.lifecyclecenter.se/wp-content/uploads/2022_05_a_Impacts-on-fuel-producers-and-costumers-of-conflicting-rules-for-life-cycle-assessment.pdf
[47] Global Assessments and Guidelines for Sustainable Liquid Biofuel Production in Developing Countries. IFEU – Institute for Energy and Environmental Research Heidelberg GmbH (2013). ifeu gGmbH: Global assessments and guidelines for sustainable liquid biofuel production in developing countries
[48] Liu et al. / Environmental Technology & Innovation (2023). Literature review on life cycle assessment of transportation alternative fuels Literature review on life cycle assessment of transportation alternative fuels - ScienceDirect
[49] Xu et al. / Environmental Science & Technology (2022). Life Cycle Greenhouse Gas Emissions of Biodiesel and Renewable Diesel Production in the United States Life Cycle Greenhouse Gas Emissions of Biodiesel and Renewable Diesel Production in the United States
[50] Prussi et al. / JRC (2020). JEC Well-To-Wheels report v5 - Well-to-Wheels analysis of future automotive fuels and powertrains in the European context. JRC Publications Repository - JEC Well-To-Wheels report v5
[51] IEA / International Energy Agency (2011) Technology Roadmap – Biofuels for Transport. IEA-Biofuel-Roadmap.pdf
[52] IEA / International Energy Agency (2022) Renewables 2022 – Analysis and forecast to 2027. Renewables 2022
[53] Förordning (2025:589) om reduktion av växthusgasutsläpp från bensin och diesel Förordning (2025:589) om reduktion av växthusgasutsläpp från bensin och diesel | Sveriges riksdag
[54] Energimyndigheten (2025) Statistik om biobränslen och drivmedel. Statistik om biobränslen och drivmedel
[55] Drivkraft Sverige (2025) Energiinnehåll, densitet och koldioxidemission, TTW och WTW Beräkningsfaktorer olika bränsletyper och dess energiinnehåll

For both liquid and gaseous fuels, there is a clear environmental benefit when compared to fossil fuels. For liquid fuels, such as biodiesel, the environmental potential is also evident when compared to non-certified renewable alternatives, although somewhat less certain due to variability in market data. The criteria go beyond legislation in key areas such as greenhouse gas (GHG) reductions and restrictions on certain raw materials (e.g. food crops and palm oil), which supports a clear environmental advantage compared to non-certified liquid fuels.

For gaseous fuels, the environmental potential is more limited, as biogas is already considered a relatively low-impact ("green") fuel. However, the criteria introduce stricter requirements than existing legislation in areas such as GHG reduction, restrictions on specific raw materials (e.g. food crops and PFAD), and control of methane leakage during production. From an overall perspective, this means that certified biogas is assessed to perform better environmentally than non-certified biogas.

The RPS analysis for liquid and gaseous fuels shows that the largest RPS has been found in a life cycle for the following areas:

- Raw materials and feedstocks used in liquid and gaseous fuels
- Climate impact and energy use
- The quality of the liquid and gaseous fuels
- Methane leakage from biogas production

RPS scheme

Life cycle stages	Area and assessment of R, P, S (high, medium or low)	Comments
Overall priority: High	**Feedstocks used in liquid and gaseous fuels** R: High P: Medium/High S: High	**Relevance** Raw material use for liquid and gaseous biofuels has high environmental relevance, as production relies largely on agricultural and forest biomass that directly affects land use, ecosystems, biodiversity, and natural resources.[56] Feedstocks include both virgin materials and residues/waste streams from agriculture, forestry, municipalities, households, retail, and food industries. Biofuels are commonly classified as first-generation (derived from high-value plant components such as sugar, maize, cereals, and grass) and advanced/second-generation biofuels (based on residues from primary production such as straw, bagasse, other lignocellulosic materials, and livestock waste, as defined in the Renewable Energy Directive (EU) 2018/2001). [57, 58] Environmental relevance is primarily linked to land use and ecosystem impacts. Cultivation of biomass requires land, water, fertilizers, and pesticides and may contribute to soil degradation, biodiversity loss, and pressure on local communities. [59, 60] Use of land for energy crops can compete with food production

[56] IPCC (2023). *AR6 Climate Change Mitigation Report*. AR6 Synthesis Report: Climate Change 2023
[57] IEA Bioenergy (2017). *Biofuels and sustainability*. IEA Bioenergy - Annual Report 2017
[58] European Commission (2018). *Renewable Energy Directive (EU) 2018/2001 (RED II)*. Directive - 2018/2001 - EN - EUR-Lex
[59] FAO (2021). *The State of the World's Land and Water Resources*. The State of the World's Land and Water Resources for Food and Agriculture – Systems at breaking point (SOLAW 2021)
[60] IPBES (2019). *Global Assessment Report on Biodiversity and Ecosystem Services*. Global Assessment Report on Biodiversity and Ecosystem Services | IPBES secretariat

		and may drive direct and indirect land-use change, potentially increasing greenhouse gas emissions.[61] Forest biomass sourcing is also environmentally significant, as forest resources are limited, and unsustainable harvesting may lead to carbon stock losses, habitat degradation, and long recovery times.[62] **Potential** Both fossil and renewable fuels release GHG emissions from a lifetime perspective. However, the potential remains high because the net impact depends strongly on feedstock origin and land-use effects.[63] Sustainably sourced biomass can achieve near-neutral carbon balance due to relatively rapid CO_2 uptake in regrowing biomass, whereas unsustainable sourcing may lead to substantial long-term emissions. Further, biofuels are commonly classified as first-generation (derived from high-value plant components such as sugar, maize, cereals, and grass) and second-generation (based on residues from primary production, e.g. straw, bagasse, and other lignocellulosic materials). Therefore, a high share of renewable, waste-based and sustainably certified feedstock and wood is critical, and robust sustainability standards are essential to mitigate environmental impacts.[64] Excluding food and feed crops (e.g. maize and cereals), palm oil, genetically modified organisms (GMO) and restricted tree species is highly relevant for liquid fuels and is possible in today's market. Further, raw material use for liquid and gaseous biofuels is primarily based on renewable agricultural and woody biomass, either virgin or residual/waste streams. The requirement for 100% biogenic residue and waste feedstock has high relevance from both climate and circular-economy perspectives. Converting municipal, agricultural, and livestock residues into energy supports resource efficiency and reduces reliance on food-based crops, representing significant potential. However, in the Nordic market most biogas come from residual/waste streams which make it medium relevance. Food- or energy crops are used in varying amounts in the production of biogas in Scandinavia/Europe, but the volumes are declining due to a wish to move biogas production away from crops that can be used for food to processing waste. In Denmark legislation limits the use of energy crops to maximum 4%[65]. An analysis ordered by Energistyrelsen in Denmark has however concluded that larger biogas facilities should be able to stop the use in 2030[66]. Several other European countries such as Germany, and France have introduced strict subsidies legislation regarding use of energy crops[67]. Crops affected mainly include food varieties such as corn and beets. Based on the findings, energy crops are not allowed in the production of Nordic Swan Ecolabel gaseous fuels. **Steerability** The steerability concerning sustainable production and certified renewable feedstocks is also high due to international recognized sustainability standards. Certification and traceability requirements strengthen steerability and transparency of renewable feedstocks used in Nordic Swan Ecolabelled fuels.
Overall priority: High	**Climate impact and energy use** R: High P: High S: Medium/High	**Relevance** Energy use and associated climate impact have high environmental relevance (R) for the production and use of renewable liquid and gaseous fuels, as greenhouse gas (GHG) emissions occur throughout the life cycle, including feedstock production, processing, transport, and combustion. Both renewable and fossil fuels emit CO_2 when combusted and therefore contribute to the greenhouse effect. However, fossil fuels introduce additional carbon to the atmosphere, while

[61] European Commission (2015). *The land use change impact of biofuels consumed in the EU*. The land use change impact of biofuels consumed in the EU - Energy
[62] IPCC (2023). *AR6 Climate Change Mitigation Report*. AR6 Synthesis Report: Climate Change 2023
[63] IPCC (2023). *AR6 Climate Change Mitigation Report*. AR6 Synthesis Report: Climate Change 2023
[64] European Commission (2018). *Renewable Energy Directive (EU) 2018/2001 (RED II)*. Directive - 2018/2001 - EN - EUR-Lex
[65] Aftale om nye krav for anvendelse af energiafgrøder til produktion af biogas af 30. juni 2021
[66] Energiafgrødeanalysen, SDU, Rapport udarbejdet for Energistyrelsen, Januar 2020
[67] https://www.europeanbiogas.eu/, visited March 2022

		CO_2 from sustainably sourced biomass can be reabsorbed through regrowth.[68],[69] Consequently, fossil CO_2 has long-term climate effects lasting centuries to millennia, whereas biogenic CO_2 generally has a shorter climate impact, provided that biomass is sourced sustainably and does not cause significant land-use change or carbon stock losses. **Potential** There is high potential to reduce climate impact by prioritising renewable fuels with high verified GHG emission savings compared with corresponding fossil fuels. The Renewable Energy Directive[70],[71] establishes minimum GHG reduction thresholds and sustainability criteria for biofuels, creating a strong framework for climate performance improvements. Requirements for the use of certification schemes for the verification of compliance with the Renewable Energy Directive also strengthen the traceability and thereby the steerability. The conclusion is that Nordic Swan Ecolabelled fuels have the greatest potential for climate benefits in the following segments: gaseous fuels for heating and industrial purposes in Denmark; pure liquid biofuels and gas in Sweden; and all biofuels in Norway and Finland. **Steerability** The steerability is low to medium regarding direct regulation of energy consumption, as the Renewable Energy Directive does not set explicit requirements on production energy efficiency. However, steerability can be strengthened through requirements for example verified compliance with RED and documentation and traceability of GHG emissions from a life cycle perspective. However, the steerability for climate impact is high due to clear rules in the Renewable Energy Directive.
Overall priority: High	**Quality of liquid and gaseous fuels** R: High P: High S: High	**Relevance** Fuel quality has high environmental relevance because material composition and production pathways for liquid and gaseous fuels vary, directly influencing combustion efficiency, pollutant emissions, engine/boiler performance and durability. Poor fuel quality may lead to incomplete combustion, higher emissions of greenhouse gases, methane slip (for gaseous fuels), nitrogen oxides, particulates and other air pollutants.[72] [73] Fuel quality also affects operational efficiency and lifetime of equipment, which in turn influences overall life-cycle environmental performance. **Potential** There is high potential to reduce environmental and climate impacts by ensuring compliance with recognized fuel quality standards. Harmonized standards define key parameters such as for example sulfur and methane content, which directly influence emissions and combustion performance. **Steerability** The steerability is high because fuel quality can be effectively controlled through measurable technical parameters and verified standards. Requiring compliance with recognized quality standards, combined with testing and verification, ensures transparency, comparability and consistent performance.

[68] IPCC (2021). *Sixth Assessment Report, Working Group I: The Physical Science Basis*. Climate Change 2021: The Physical Science Basis | Climate Change 2021: The Physical Science Basis
[69] IEA Bioenergy (2023). *How bioenergy contributes to a sustainable future* IEA_BIOENERGY_REPORT.pdf
[70] European Commission (2018). *Renewable Energy Directive (EU) 2018/2001 (RED II)*. Directive - 2018/2001 - EN - EUR-Lex
[71] European Commission (2023). Renewable Energy Directive (EU) 2023/2413 (REDIII). Directive - EU - 2023/2413 - EN - Renewable Energy Directive - EUR-Lex
[72] IPCC (2021). *Sixth Assessment Report, Working Group I: The Physical Science Basis*. Climate Change 2021: The Physical Science Basis | Climate Change 2021: The Physical Science Basis
[73] EEA (2019). *EMEP/EEA Air Pollutant Emission Inventory Guidebook 2019*. EMEP/EEA air pollutant emission inventory guidebook 2019 | Publications | European Environment Agency (EEA)

Overall priority: Medium	**Methane leakage from biogas production** R: High P: High S: High	**Relevance** Biogas consists of about 70% methane, 30% carbon dioxide and other gases such as hydrogen and hydrogen sulphide.[74] Methane is a potent greenhouse gas with a global warming potential (GWP100) of approximately 27–30 relative to CO_2 according to IPCC (Intergovernmental Panel on Climate Change) sixth assessment report (AR6). Methane leakage from the biogas plant, and from biogas upgrading, therefore has great impact on the total balance of GHG reductions for the production. Reducing the methane emissions from biogas production is therefore considered to have high environmental relevance. **Potential** A Danish Energy Agency study revealed a leak rate of 2.5% from biogas production.[75] This poses an unnecessary climate impact that significantly affects the total climate effect of the biogas production, due to the high GWP of methane. Methane leakage can occur both in anaerobic digestion plants, and at upgrading facilities. Emissions occur from ventilation, overflow drain, biofertilizer storage etc. Usually, the biofertilizer storage contribute to highest leakage at the biogas plant. At the upgrading facility methane may occur in the outgoing residual gas[76]. Since these leaks could be significantly mitigated through the implementation of appropriate procedures the potential is set to high. **Steerability** The steerability is considered high because methane leakage can be effectively controlled through real-time monitoring systems or an LDAR program. Real time monitoring is intended as a best practice measure for the most relevant process units and an LDAR program is based on the Best Available Techniques (BAT) Conclusions for Waste Treatment ((EU) 2018/1147). Requiring compliance with recognized procedures ensures transparency, comparability and consistent performance.

[74] https://bureau-industrial-transformation.jrc.ec.europa.eu/sites/default/files/2019-11/JRC113018_WT_Bref.pdf
[75] https://www.globalmethane.org/case-studies/library/details.aspx?id=20
[76] 2016-17-handbok_metanmatning.pdf (svensktvatten.se)

MECO scheme

Liquid & gaseous fuels	Raw material	Production	Use / operational processes	End of life
Material	Liquid fuels: - Crude oil extraction (diesel, petrol, natural gas etc.) - Organic waste/biomass for biofuels (e.g. waste oils, animal by-products, crops oils for HVO). Feedstock amounts and resource inputs are significant. Gaseous fuels: - Organic waste/biomass for biogas (e.g. animal by-products, agriculture, aquaculture waste, marine cultivation, household waste, sludge, manure, sewage). - natural gas infrastructure for LNG.	Refining of fossil fuels Production and fuel design	Emissions from fuel combustion (in engines/boilers etc.)	Liquid fuels & gaseous fuels: - little to no end-of-life materials if combustion consumes all fuel. - Degassed material from biogas production may continue to emit methane.
Energy/ CO_2	Liquid: - High energy inputs for extraction from fossil fuels - Energy for agricultural production of feedstocks (machines etc.) Gaseous: - Energy for biomass collection. - Methane emissions from biomass decomposition and leakages in gas networks relevant for climate impact.	Energy-intensive refining, converting, purification, upgrading, compressing raw materials into fuels	Liquid: - Fossil: SOx, NOx, CO_2 and particulates from diesel combustion. - HVO: Lower fossil CO_2 but tailpipe NOx still present. Gaseous: - Combustion emissions for methane (CO_2, NOx);	Energy efficiency of the combustion process
	Greenhouse gas emissions in the life cycle from cultivation to combustion (Well-To-Wheel GHG) (5)(8)(9)(10): - Conventional diesel: ~90-95 g CO_{2eq}/MJ - Petrol: ~90-95 g CO_{2eq}/MJ - HVO (waste-based): ~10 – 25 g CO_{2eq}/MJ - HVO (crop-based): ~30 – 50 g CO_{2eq}/MJ - Biomethane (waste/manure): ~10 – 20 g CO_{2eq}/MJ - Natural Gas / LNG: ~67 – 75 g CO_{2eq}/MJ			
Chemicals	Liquid and gaseous: - Production chemicals used in refining processes - Pesticides and emissions associated with extraction of crude and cultivation of bio-feedstocks - emissions from harvesting and transport.	Refinery process emissions, especially for fossil diesel Additives, production chemicals		
Other	Changes in agriculture and forestry (direct (LUC) and indirect (ILUC)) Biodiversity impacts and use of GMO raw materials	Social and environmental implications of production location and practices Working conditions and health effects	Quality parameters that influence overall fuel performance Emissions during combustion	

7 Future criteria

This chapter will be developed after the consultation.

8 Criteria version history

This chapter will be developed after the consultation.

9 How to apply and regulations for the Nordic Ecolabelling

Application and costs

For information about the application process and fees for this product group, please refer to the respective national website. For contact information see the beginning of this document.

The application consists of an application form/web form and documentation showing that the requirements are fulfilled.

Licence validity

The Nordic Swan Ecolabel licence is valid providing the criteria are fulfilled and until the criteria expire. The validity period of the criteria may be prolonged or adjusted, in which case the licence is automatically prolonged, and the licensee informed.

Revised criteria shall be published at least one year prior to the expiry of the present criteria. The licensee is then offered the opportunity to renew their licence.

Responsibility for Compliance with Applicable Legislation

When applying for the Nordic Swan Ecolabel, the applicant/licensee confirms compliance with all current regulatory requirements related to both the exterior and interior environment in connection with the production and handling of the product(s) covered by the application. Furthermore, the applicant declares that all applicable regulatory requirements within the Nordic region are met for the product(s). Compliance with these regulations is a prerequisite for obtaining a licence.

On-site inspection

In connection with handling of the application, Nordic Ecolabelling normally conduct on-site inspection visit/-s to ensure adherence to the requirements. Scope and timing of on-site inspection is evaluated per product group and adapted to the specific application situation.

Regulations for the Nordic Ecolabelling of products

When the Nordic Swan Ecolabel is used on products the licence number shall be included.

More information on graphical guidelines, regulations and fees can be found at www.nordic-swan-ecolabel.org/regulations

Appendix 1 Guidelines in using mass balance

Documentation for compliance with requirement O2 Material composition and O7 Reduction of greenhouse gases must be done on an annual basis using mass balance according to Directive (EU) 2018/2001, as amended by Directive (EU) 2023/2413 (RED).

In addition, it is not allowed to include components in the Nordic Swan Ecolabelled product's production line that do not meet requirement O3 *Renewable raw materials not allowed to use*.

The licensee must have a system to account all purchased renewable components used for the Nordic Swan Ecolabelled fuel. The accounting system must be part of and meet the EU RED requirements to verification of compliance with the sustainability criteria for biofuels and bioliquids. The accounting system shall clearly state which parties are accounted to the Nordic Swan Ecolabelled fuel. An independent competent third party shall control and verify that:

- the accounting system is accurate and reliable in accordance with EU RED
- the accounting of renewable components included in the Nordic Swan Ecolabelled fuel is correct
- the Nordic Swan Ecolabelled fuel meets requirement O2 *Material composition* and requirement O7 *Reduction of greenhouse gases* based on the accounting system and deliveries accounted to the Nordic Swan Ecolabelled fuel
- do not include components that do not meet requirement O3 *Renewable raw materials not allowed to use*
- the licensee can document that the volumes of renewable components match the volume of Nordic Swan Ecolabelled fuel sold together with other sold volumes to other customers/customers' commitments[77].

Figure 1 and Figure 2 gives an illustration of the accounting systems.

Gas transmission and distribution infrastructure

Biogas is, if not consumed directly on-site for the purpose of electricity production, upgraded to biomethane (additional conversion step) and in some cases injected into the natural gas grid. The gas grid represents a ’mean of transport’ and a ’storage facility’ at the same time. Therefore, biomethane can be mixed in this transmission and distribution infrastructure (gas grid), provided the infrastructure is interconnected.

The physical input (injection) and output (withdrawal) of gas must be documented by economic operators as part of their mandatory mass balance records which are essential for the certification process.

Bio-LPG

Bio-LPG is mixed in the same infrastructure as fossil LPG. Requirement O2 (100 % biomass) can be documented through a mass balance system. The mass balance system ensure that the bio-LPG do not exceed the renewable material injected in the system.

[77] Customer commitments can be either customer agreement or promise to customers about a quantity and share of renewable raw materials or quantity of renewable raw materials with a promise for maximum value of climate gases (alternatively reduction of greenhouse gases).

According to the mass balance method of verifying compliance, there is a physical link between the production and the consumption of bio-LPG. Trade in certificates, so called Book and claim is not accepted. Book and claim imply that there is no physical connection between the sustainability claim (biological origin) and the product (gas).

Figure 1 Illustration of the accounting system for liquid fuels

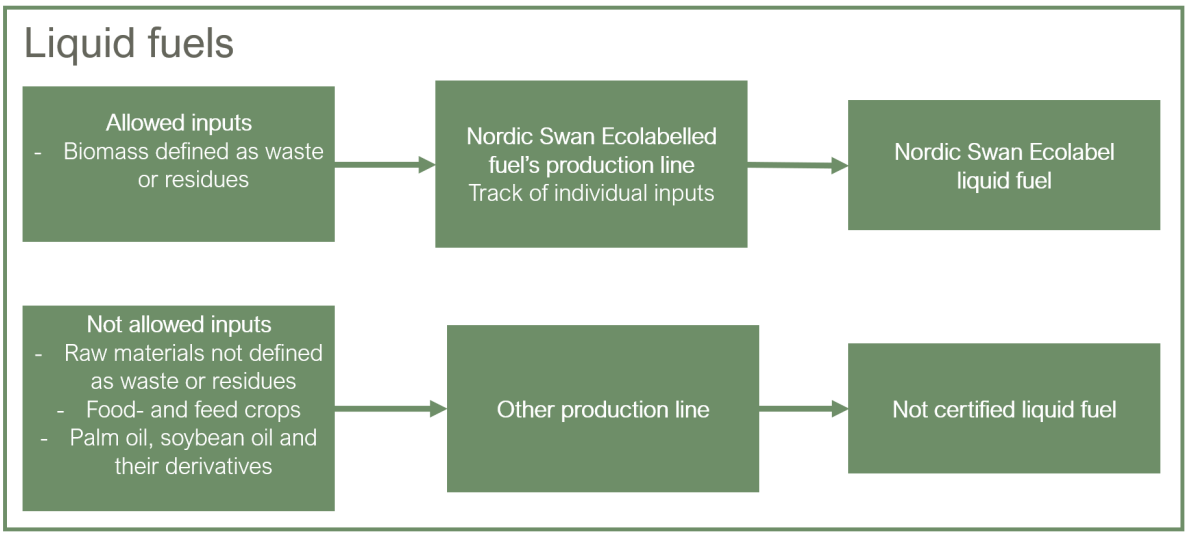
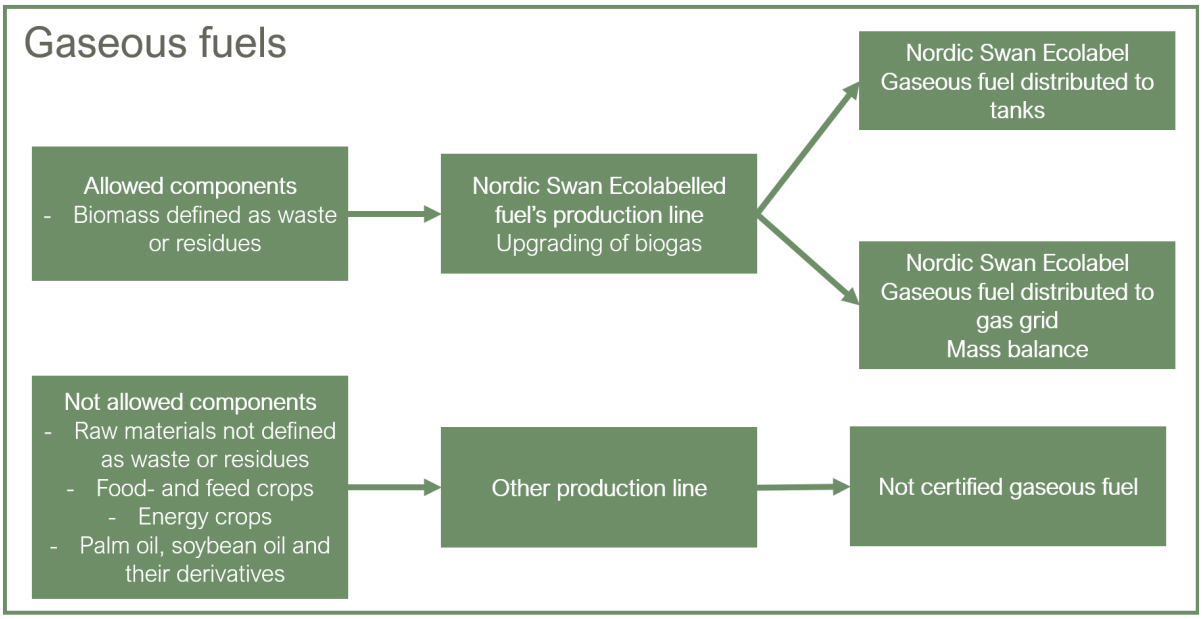


Figure 2 Illustration of the accounting system for gaseous fuels



Appendix 2 Declaration of raw materials not allowed to use

Applicant name:

It is hereby declared that:

a) raw materials defined as food- and feed crops are not used in the production of liquid and gaseous fuels.

b) palm oil and soybean oils, including by-products, residues and waste fractions from palm and soybean oil industries (e.g., Palm Fatty Acid Distillate: PFAD, Palm Effluent Sludge: PES and soybean meal) are not used in the production of liquid and gaseous fuels.

c) Energy crops are not used in the production of Nordic Swan Ecolabelled gaseous fuels.

The requirement does not cover feedstock defined as non-food cellulosic material or residues and waste product generated form the cultivation of food- and feed crops.

The requirement does not cover residues and waste products generated by households or commercial, industrial- or institutional facilities in their role as end-users of a product that can no longer be used for its intended purpose.

Applicant's signature:

Date:	Company name:
Responsible person:	Responsible person’s signature:

Appendix 3 Declaration of GMO raw materials

Name of feedstock:
Name of supplier:

It is hereby declared that raw materials used in Nordic Swan Ecolabelled fuels is not genetically modified*.

** Genetically modified organisms are defined in EU Directive 2001/18.*

This requirement does not include residuals or waste defined according to the Renewable Energy Directive (2018/2001/EC), as amended by Directive 2023/2413/EU, however not by-products, residues and waste fractions from palm and soybean oil industries (e.g., Palm Fatty Acid Distillate: PFAD, Palm Effluent Sludge: PES and soybean meal).

Applicant's signature:

Date:	Company name:
Responsible person:	Responsible person’s signature:

Appendix 4 Analysis and test laboratories

General requirements for test and analysis laboratories

Tests must be carried out in a correct and competent way. The analysis laboratory/test institute must be impartial and professional.

If accreditation is not separately required, the test and/or analysis laboratory must comply with the general requirements of the EN ISO 17025 standard for the quality control of test and calibration laboratories or have official GLP status.

The applicant's laboratory can be approved if it is accredited and complies with the requirements of the standard EN ISO 17025.

When testing quality and performance properties, the applicant's own laboratory can be approved even if it is not accredited. The following applies:

- The laboratory has a certified quality system (ISO 9001) which includes testing, and
- The laboratory can show that the test results obtained are similar to the results from an accredited test laboratory through initial tests performed as parallel tests. Parallel tests must as a minimum be performed when test standards are updates, and
- The laboratory performs the tests in accordance with an established plan for the current test standard and documents the selection of products in a product series for worst case tests, and
- An independent inspection body shall, on the basis of test reports, confirm that the manufacturer's test results are consistent with the results of an accredited laboratory. This can, for example, be evaluated as part of an inspection of the laboratory's quality system carried out by the inspection body for certification of the quality system.