



SolidStandards

Enhancing the implementation of quality and sustainability standards and certification schemes for solid biofuels (EIE/11/218)



D5.2d
Case study of
sustainably certified
solid biomass supply
chain
Swan Labelled Pellets



The SolidStandards project

The SolidStandards project addresses on-going and recent developments related to solid biofuel quality and sustainability issues, in particular the development of related standards and certification systems. In the SolidStandards project, solid biofuel industry players will be informed and trained in the field of standards and certification and their feedback will be collected and provided to the related standardization committees and policy makers.

SolidStandards is coordinated by:

Cosette Khawaja & Rainer Janssen

WIP Renewable Energies
Sylvensteinstrasse 2
81369 Munich, Germany
cosette.khawaja@wip-munich.de
rainer.janssen@wip-munich.de
Tel. +49 (0)89 72012 740



About this document

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Morten Tony Hansen

FORCE Technology
Hjortekaersvej 99
DK-2800 Kongens Lyngby
mth@force.dk
Tel. +45 7215 7755



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1. Introduction

1.1. General introduction

As of January 2013, national sustainability requirements for solid biomass exist in Belgium and the UK, and their introduction is debated in e.g. the Netherlands. Also, voluntary industry standards are developed by the various organizations. As part of the Solidstandards project (and especially regarding the work on sustainability certification), four existing different solid biomass supply chains using voluntary sustainability standards are investigated in detail, including all steps from sourcing the raw material (e.g. wood chips from the forest or sawdust), all pre-processing steps (e.g. pelletisation) to the end-user (medium-to large scale consumers).

The specific aim is to explore different types of case studies, i.e. to investigate different supply chains in terms of:

- Size of the end-user: from medium-sized installations of ≥ 1 MW capacity to (very) large consumers such as utilities with capacities of ≥ 100 MW
- Geographical boundaries, i.e. regional, national and international supply chains (including one chain originating outside the EU-27)
- Type of biomass: e.g. wood chips, wood pellets, or other solid biomass
- Each case study will investigate *applicability, barriers, costs, time efforts*, etc. associated with the actual implementation of sustainability certification of solid biomass.

Originally, it was also intended to analyse the implications of the EC decision on possible mandatory solid biofuel sustainability criteria. However, at the time of writing (January 2013), the commission has not yet published a decision. Nevertheless, the case studies of sustainably certified solid biomass chains will provide valuable experiences to other market actors, but also to national governments which still may decide to implement mandatory criteria on a national level.

1.2. Aims and scope

This case study focuses on Nordic Ecolabelling - The Swan Label - of wood pellets in Nordic countries. The study aims to investigate and analyse concepts, introduction and implementation experience, current status and on-going development of the Swan Label, by interviewing stakeholders from all possible levels in the supply chain. No pellets currently carry the Swan label and the study focuses on finding reasons for this limited success.

2. Description of the Nordic Ecolabelling Swan Label

2.1. General description

The Nordic Ecolabel is a voluntary ecolabelling scheme that evaluates a product's impact on the environment throughout the whole life cycle. The label guarantees among other things that climate requirements are taken into account, and emissions of CO₂ (and other harmful gasses) are limited - where it is most relevant.

The Nordic Ecolabelling of pellets was established in 2007 and includes requirements on manufacturing methods, transportation and storage. The aim is to identify the top-grade quality from an environmental perspective. The quality of the pellets shall mean that they are easy to use and thus meet the end-users' wishes when converting to a renewable energy source that reduces the emission of greenhouse gases. In addition, the energy required to manufacture the pellets is limited to ensure the energy efficiency. Finally the combustion shall not entail a risk to health or the environment.

It is possible to Nordic Ecolabel biofuel pellets intended primarily for private use in small to medium-scale burners. These boilers and stoves are often used in built-up areas.

To minimise the effects of emissions on health and the environment, combustion must be optimised. This means that the pellets must be of a consistent, non-perishable grade, and that the size of the pellets must be suitable for the fireplace. Physical properties, such as density, size and moisture content, must not vary too greatly.

The Nordic Ecolabel is the official Ecolabel of the Nordic countries and was established in 1989 by the Nordic Council of Ministers with the purpose of providing an environmental labelling scheme that would contribute to a sustainable consumption. The Nordic Ecolabel is established and internationally well-known. A recent Nordic market survey showed that in the Nordic countries 94 percent recognized the trademark as an Ecolabel.

The Nordic Ecolabel scheme is managed by secretariats in each of the Nordic countries. The secretariats also manage the European Ecolabel.

An ecolabelled product



Manufacturer:

Diameter: 6 mm 8 mm

Density: $630 < X \leq 700 \text{ kg/m}^3$
 $700 < X \leq 780 \text{ kg/m}^3$

Calorific value: MJ/kg

Ash content of dry matter: ≤ 5 weight %

Moisture content: < 9 weight %

Raw material information:

Carrier:

Example of Swan Label

2.2. Coverage and target groups

The Swan Label is aimed at manufacturers, importers and resellers that can apply for a licence. The application must be backed up by the pellet manufacturer via a signature.

When applying for a license the application must specify the grade that the manufacturer intends to label with The Swan, i.e. pellet class, size and density.

The intention from Nordic Ecolabelling is to assist private pellet consumers using small to medium scale burners in finding an environmentally safe fuel pellet.

2.3. Recognitions

Nordic Ecolabelling requires a certain share of certified feedstock for pellets made from virgin wood. The scheme accepts forestry standards and certification under certain conditions.

Regarding standards, they must balance economic, ecological and social interests and comply with the UN Rio Declaration, Agenda 21 and the Statement of Forest Principles as well as respect applicable international conventions and agreements.

Also, the standard must contain absolute requirements and encourage and promote sustainable forestry.

The standard must be generally available and it must have been developed in an open process to which stakeholders with ecological, economic and social interests have been invited.

Regarding forest certification, the system must be open, have wide-spread national or international credibility and be able to verify that the requirements in the forestry standard (see above) are fulfilled.

The certifier must be an independent and recognised entity. The certifier must be able to verify that the requirements in the standard are met, able to communicate the results and be suitable for the efficient application of the standard.

Nordic Ecolabelling may request further documents to assess whether the requirements regarding standards and certification systems are met.

2.4. Governance and management

The Nordic Ecolabel organisation is responsible for management of the labelling scheme and developing criteria. The organisation consists of five national Ecolabelling organisations in each of the Nordic countries. With over 100 employees the Nordic Ecolabelling organisation has national offices in Stockholm, Copenhagen, Helsinki, Oslo and Reykjavik.

The criteria are the same in all the Nordic countries. The choice of criteria is made by the Nordic Ecolabelling Board with representatives from each country.

A product or service that has been granted the Nordic Ecolabel in one of the countries can be marketed in the other Nordic countries without an additional application process. However there is a small administration process for registering the product in each country.

Nordic Ecolabel has an application fee of 2,000 Euro and annual licensing fees. The fees are used for:

- Development of criteria
- Checking products
- General information.

3. Case study setting

3.1. Supply chain

For this case study, the supply chain of Swan Labelled wood pellets produced in Norway and sold for small scale consumers and retailers by Shell Danmark A/S in Denmark is described.

The described pellets are to date the only ones that have carried the Swan Label. As the demand for Swan labelled pellets in Denmark was limited the initiative was not prolonged after the pellet supplier went bankrupt in 2009.

3.2. Product specifications

In order to carry the Swan Label, the pellets have to meet criteria issued by the Nordic Ecolabelling organisation.

The criteria concern:

- The existence of environmental and quality control schemes at the producer
- That regulatory requirements are met
- Declaration of origin and content - certain requirements for certification when virgin feedstock is used, no additives allowed
- Limits to the energy consumption during pellet production
- Continuous quality inspection - autonomous and third party
- Proper packaging and delivery

The detailed technical specifications are available here in the current criteria document that was published 20 December 2011 and is valid until 31 December 2014. The document can be downloaded here:

<http://www.svanen.se/Templates/Criteria/CriteriaGetFile.aspx?fileID=135892001>

3.3. The actors

The Swan Label for fuel pellets is a system initiated by the Nordic Ecolabelling which is the official ecolabelling scheme of the Nordic countries initiated by the Nordic Council of Ministers.

As mentioned above only one supply chain has adapted the criteria and marketed Swan labelled wood pellets during the lifetime of the label. A Norwegian pellet manufacturer has produced special pellets and sold them to Shell Danmark A/S who resold pellets to a number of retailers as well as directly to small scale end users. The pellets were certified by a Danish technological service provider.

3.3.1. The producer

The pellets were produced by Norwegian Norsk Pellets in Vestmarka owned by Arbaflame AS. The pellets were made on basis of clean wood residues from wood processing industries locally and in Sweden. The plant is situated 90 km to the North East of Oslo and had a capacity of 40,000 t/y. The feedstock, saw dust from spruce and pine, was transported to the plant by truck from just as the pellets were transported from the plant by truck.

The facility applied a special pretreatment technology to the feedstock - steam explosion - that would release and distribute evenly the lignin content over the particles. The result would be significantly reduced energy consumption in the milling process and very durable pellets almost without fines and with hydrophobic properties. The pellets were 6 mm and provided bulk or packed in small bags (12.5 kg). Key pellet properties:

- Density: approx. 740 kg/m³
- Moisture content: 5-9%
- LHV: 4.8 kWh/kg

The Swan label was introduced in Norsk Pellets in 2006.

Today, the facility is operated by Pemco Pellets Norway who is able to apply the same technology and produce a type of pellets that are equally high in demand by customers, however, they do not carry the Swan label.

3.3.2. The logistics company

The Danish branch of Shell initiated marketing of the ecolabelled pellets in Denmark and marketed the pellets directly towards small scale consumers in Denmark under the brand name "Premium Pellets". The labelled pellets were also sold to a number of small scale retailers operating in Denmark, amongst these retailers of pellet stoves and pellet boilers.

3.3.3. The end-users

The Swan labelled wood pellets were used primarily by small scale consumers and were especially attractive to owners of wood pellet stoves as they were 6 mm pellets while the conventional Danish pellet market would be an 8 mm market.

Swan labelled pellets were sold in thousands of tonnes annually in Denmark. The main part of the pellets produced in Vestmarka was sold in Sweden and some in Norway.

3.3.4. The certification body

Nordic Ecolabelling is the organisation behind developing criteria and issuing a label for a certified product.

3.3.5. The certifiers

According to the criteria the manufacturer is responsible to engage with third party entities that are to inspect production and/or analyse the product.

In the current setting, the Danish Technological Institute has been responsible for the chemical analyses while Nordic Ecolabelling has been responsible for certifying the production according to their criteria.

4. Method and data collection

The study largely depends on publicly available information. It draws on data collected from interviews and literature search

Data was collected from questionnaire surveys and interviews with the following stakeholders in the period of November 2012 - May 2013:

- Thomas Christensen, Ecolabelling Denmark, responsible for the managing and further development of the Swan label for fuel pellets
- Tine Due Hansen, Ecolabelling Denmark, Communications responsible
- Birgitte Holm Christensen, Danish EPA, formerly at Ecolabelling Denmark (1999 - 2006), responsible for initially proposing/promoting the application of the Swan Label to fuel pellets
- Martin Wiell Christensen, Shell Danmark A/S, responsible for introducing Swan labelled pellets in the Shell product assortment
- Michael Gernaa, DCC Energi A/S, formerly in the sales organisation in Shell Danmark A/S
- Ronny Olsson, Pemco Norway, previously at Norsk Pellets as production manager at the pellet production plant
- Jørgen Davidsen, BMB Import ApS and fyr-selv.dk, Tjæreborg, importer and retailer
- Ole Pedersen, formerly braendexperten.dk, retailer
- Ronnie Kristensen, Ekman Denmark, formerly Vapo/Neova and Statoil, manufacturer, large scale trader
- Tina Pedersen, Dantræ Braendesalg, small scale retailer

The interviews were complemented by a literature search whenever required. Direct sources of information appear from the reference list.

5. Results and discussion

5.1. Initiating the system: Why a labelling scheme?

The possibility of Swan labelling fuel pellets was initiated by Nordic Ecolabelling. Birgitte Holm Christensen was a driver of the process and had gained the experience that pellet consumers in Denmark and elsewhere were left alone regarding a trustworthy quality certificate.

The aim of the label would be to promote low carbon heating source by guaranteeing a fuel that:

- is easy to use in order to convince consumers to switch from oil to pellets, e.g. has a high and constant quality
- provides for a clean combustion e.g. has a high degree of cleanliness and physical stability
- has a low energy consumption in the production phase
- origins from sustainably managed sources if not based on residues.

The idea was carried out during 2005 and 2006 where the labelling scheme was launched.

5.2. Start-up: How was the scheme set-up?

Norsk Pellets implemented the Swan label scheme in 2006. The driver would be a hope for an increased sale of pellets. The implementation period would take six months. According to Ronny Olsson the long implementation phase was mostly due to the fact that Norsk Pellets was the first company to apply the labelling scheme.

Like many other oil suppliers, Shell Danmark A/S had for some time been expanding their fuel assortment with wood pellets, primarily for their customers in the farming business. Scanning the market for a candidate to supply their "premium pellets" brand aimed at quality minded small scale consumers, they according to Martin Wiell Christensen found the product from Norsk Pellets that had special properties and was already carrying the Swan label.

From 2006 Shell Danmark A/S marketed Swan labelled pellets.

5.3. Introduction and implementation: Overcoming the challenges

According to Ronny Olsson, the implementation of the labelling scheme at Norsk Pellets did not encounter specific barriers or problems. The company had to implement new routines and had to invest in a new printing device for the packaging line in order to enabling tracking of the production date.

The costs for implementing the scheme consist of an application fee and utilisation fee. On top come costs for inspection visits and renewal fees.

According to Ronny Olsson the costs for obtaining and maintaining the label did not seem unreasonable, however, as the label did not entail an increase in sales volume, the investment resulted in an overall negative outcome of the action.

Seen from the Nordic Ecolabelling point of view the challenge was to market the label towards consumers to create a market pull and, furthermore, to market it to other pellet manufacturers.

Type of fee	Amount
Application fee	EUR 2000 + VAT
Renewal fee	EUR 1000 + VAT
Inspection visits in Europe and more than one visit within the Nordic region	EUR 500 + VAT per visit
Inspection visits outside Europe	EUR 1500 + VAT per visit
Extension of existing licence	EUR 0/250/500/1000 + VAT
Licence fee for Nordic region	0.15% of turnover + VAT from EUR 0-20 million per year 0.05% of turnover + VAT > EUR 20 million per year
Minimum fee for Nordic region*	EUR 1500 + VAT per year
Maximum fee for Nordic region	No maximum fee

Nordic Ecolabelling prices for labelling fuel pellets as of 2013, from website.

The labelled manufacturer went bankrupt in 2009 after challenges with a fire in the factory and according to Michael Gernaa amongst others due to the not optimal logistics where feedstock had to be transported to the mill by truck via narrow roads and the pellets had to be taken from the mill again by trucks. This view is supported by articles from 2005-2007 in a local Norwegian paper - Glomdalen - where it is described that the factory had logistical challenges as the Swedish trucks (road trains) were firstly too long and secondly too wide to obtain a permit to drive in Norway [1].

Shell Danmark did not find it worth while to find another manufacturer and sustain Swan labelling their Premium Pellet brand. In 2009, when Norsk Pellets faced bankruptcy, Shell Danmark was in a transition process, focusing on their core business, which did not include sale of pellets. In 2009 DCC Energi took over the sale of heating oil and pellets for privates and industry from Shell Danmark. The pellets from DCC Energi were marketed as Premium Pellets but did not carry a Swan Label.

5.4. On-going development: Opportunities and challenges ahead

The main challenge seen from the Nordic Ecolabelling offices is that it is no longer possible for the consumer to buy Swan labelled wood pellets. Nobody markets pellets with a Swan label and the demand from consumers might not be large enough to sustain labeling of pellets.

The retailers report on big interest from the consumers in pellets of the same quality as that of the Swan labelled pellets. The size, durability and absence of fines and very positive experiences using these pellets would, according to Jørgen Davidsen, be the driver of this interest and demand, not the presence of the Swan label.

This view is supported by most of the interviewees. The Danish pellet market is mentioned as a market with a main focus on "discount". Some consumers seem to take short-sighted decisions. According to Tina Pedersen, they would rather save a few kroner on each pallet of pellets not paying attention to the fact that they might have to buy more pallets of the cheap pellets if the quality, in terms of heating value or durability, makes the boiler or stove perform worse than with better pellets.

Going a bit further into detail, many consumers consider pellets to be sustainable as is. The reason for small scale consumers to consume wood pellets would in most cases be that they have substituted fossil fuel, mostly heating oil, with a wooden fuel made from a residue that in many cases would have been lost if not used for pellets. Thus, they feel no immediate

reason to consider further labels or other measures but the price. In many cases, the change away from fossil fuel has on top entailed a dramatic increase in fuel efficiency as the boiler or wood stove has been exchanged with a new boiler or pellet stove. Wood pellets and pellet boilers are often perceived as sustainable by definition, as Birgitte Holm Christensen explains the consumers view.

In Denmark the pellet market quality assurance is to a large degree subject to a relationship of trust between the manufacturer/retailer and the consumer. Proprietary standards have for a long period of time prevailed. As an example of this, Ronnie Lange Kristensen explains that the renowned "HP quality" still exists and is used for marketing pellets. HP - Hans Poulsen - started production of briquettes and pellets from saw dust in the early 1980'es in Vildbjerg in Jutland. The pellets were durable and popular and set a fashion. HP has retired many years ago and the production in Vildbjerg has almost ceased due to lack of feed stock. However, as long as the brand is maintained (now as High Performance) and the owners of the brand manage to produce high quality pellets, they basically see no need to change for a public quality label for the Danish market.

The high focus on low price and the absence of interest in public quality labels amongst consumers as well as the fact that quite many farmers have empty space and a truck and thus can easily set up a small "stable door sale" of wood pellets, also paves the way for low quality pellets finding to the small scale market place and possibly entailing negative combustion experiences at consumer level. Along with a strongly increasing cross border-sale of wood pellets (in 2012 estimated to 250,000 t/y) over the German-Danish border driven by the difference in VAT, this is the driver of a growing sense of the need for quality labeling in Denmark.

This shows from the recent forming of the Danish Biofuel Association, an association mainly of manufacturers and traders/retailers of fuel pellets and other biofuels. The association works with quality labelling of pellets and is amongst others examining the EN-plus scheme as one of the most widespread and professionally organised alternatives.

Seen from the Nordic Ecolabelling this growing sense of the need for quality labelling amongst market actors may be an opportunity to promote the Swan label. The challenges are numerous.

At the general level, the experience from Nordic Ecolabelling according to Tine Due Hansen shows that environmental labels resonate better with female consumers and mainly with products purchased on a daily basis. Choices within technical equipment for the home are still to a large degree taken by the male consumers which then reduces the survival chance of Swan labelled pellets.

Furthermore, during the recent 5-8 years, strong competitors on the labelling scene have appeared. There now exist widespread and well managed systems that may seem an alternative to the Swan.

The promotion effort needed is high all along the supply chain - manufacturers need to decide for a license and consumers need to prioritize Swan labelled pellets. It may resemble the story of the chicken and the egg over again. Tine Due Hansen believes that articulating sustainability issues on wood pellets as a question of caring about extermination of species, deforestation in the Baltic states etc. would make consumers consider choosing a labelled product.

During 2013, the Swan labelling scheme is to be evaluated during 2013 and then the criteria are to be updated, according to Thomas Christensen.

5.5. Is the Swan Labelling of fuel pellets a success story?

Former employee at Shell Danmark A/S, Michael Gernaa, regards the Swan Label a positive measure during its existence in the Shell context. It gave the trader a great basis to argue for

the advantages of the provided pellets in terms of durability, combustibility etc. and thus turning focus away from the relatively high price of the pellets. Mr. Gernaa stresses that, at a general level, labelling of pellets is a delicate business and that credibility of a label may vary greatly with origin of the pellets.

In terms of proving that an ambitious labeling scheme can contribute to the marketing of pellets of a very high and amongst consumers very demanded quality, even in a fuel market that is very low-price focused and very hesitant to demand public standards, the Swan label is successful.

In terms of the number of manufacturers and amount of traded pellets that have to date carried a Swan Label, the scheme has not been a success. Perhaps a revision of the criteria will pave the way for a broader use of the Swan.

6. References

[1]

Local newspaper on problems with truck transport to the pellet mill, Glomdalen 2007-12-17 (<http://www.glomdalen.no/nyheter/article3197171.ece>) and 2005-08-24 (<http://www.glomdalen.no/nyheter/article1708251.ece>)