

**Nordic Ecolabelling of
Grocery stores**

Background document

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In November 1989, the Nordic Council of Ministers adopted a measure to implement an official voluntary ecolabelling scheme, the Nordic Ecolabel, also known as the Swan. The organizations/companies listed below administer the Nordic Ecolabelling scheme on assignment from their national governments. For further information, please visit the respective Web sites:

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Summary

This document provides the background to the environmental requirements (criteria) regarding the ecolabelling of grocery stores with the Nordic Ecolabel, the Swan. The document is for applicants, consumers and interest groups. It justifies and discusses the Nordic Ecolabel criteria.

The document reflects on the choice of product group and criteria in relation to the environmental objectives of Nordic Ecolabelling's environmental philosophy and strategy. It covers the goal of grocery stores to reduce:

- energy consumption
- the negative environmental impact of the production, sale and consumption of foodstuffs and non-food products
- the negative environmental impact of operating the store
- emissions from transport and distribution, which can cause climate change and emissions to air
- the use of packaging and amounts of waste
- problems in the working environment

The criteria also discuss the potential environmental gains of ecolabelling grocery stores, and how these requirements can be checked and documented.

The background document examines the requirements on environmental management and discusses these with reference to Nordic Ecolabelling's objectives.

Further, the background document discusses possible future criteria for the ecolabelling of grocery stores.

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Further, national working groups, selected experts and suitable stores have been consulted during the development work.

The criteria document for the ecolabelling of grocery stores provides a systematic means of environmental improvement through a framework of obligatory and point score requirements. All grocery stores that fulfil the requirements may apply for a Nordic Ecolabel licence.

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CALCULATION TOOL FOR ASSESSING THE ENERGY CONSUMPTION AND TEWI OF GROCERY STORES

1 Introduction

1.1 Scope and definition of the product group

The Nordic Ecolabelling Board has decided to introduce requirements for grocery stores. Operating a grocery store uses much energy and produces pollution in the local environment while production and goods transports cause an impact to the global environment.

The Nordic Ecolabelling of stores is beneficial to the environment through energy conservation, greater exposure and turnover of ecolabelled and organic products, and information to the consumer about the environmental aspects of grocery stores.

In general, consumers' knowledge of grocery stores and the environment is limited to the products on the shelves. Since Nordic Ecolabelled stores must provide a range of ecolabelled and organic products, consumers are provided a real choice. Other parameters are also included to determine the store's overall environmental impact. For example, grocery stores generally have high energy consumption since refrigerator and freezer equipment require much energy, particularly if they are open, which is often the case in stores. Goods sold by the store are often transported long distances, which requires energy. By providing grocery stores the possibility to become ecolabelled, Nordic Ecolabelling also provides consumers a real opportunity to choose a store with a reduced environmental impact.

Groceries are goods that, unlike durable goods, are designed to be consumed or used over a limited period. Examples of groceries include foodstuffs, hygiene articles, tissue paper and cleaning agents.

However, the project and reference groups during the initial development of Nordic Ecolabel criteria for grocer stores were in general agreement that foodstuffs are an important component of a comprehensive range of groceries, which defines a grocery store. This is taken into account in the criteria document, which requires that a minimum proportion of the product range is food.

50% of goods (by turnover) in a grocery store must be groceries. This means that a store may also sell special goods such as textiles, kitchen utensils, electronics and music. Most grocery stores in the Nordic region do so today.

The secretariat group has also concluded that wholesalers, online stores and large kiosks are also eligible for ecolabelling.

2 Other ecolabels for grocery stores

2.1 Ecolabels in the Nordic countries

Sweden

Sweden has the Good Environmental Choice ecolabel for grocery stores. The Good Environmental Choice ecolabel for grocery stores is one of the labels awarded by the Swedish Society for Nature Conservation. New criteria were published in January 2009. These are based on a store fulfilling a range of basic requirements focused on its product range and “authentic environmental work”. In addition, the store must fulfil yearly requirements of different themes, such as seafood or climate impact.

The product range requirements stipulate that the store must sell a certain range of ecolabelled and organic products and that it must only sell ecolabelled products in certain product areas. The requirements on the store’s operation cover areas such as a person responsible for environmental issues, consumables, and the use of Good Environmental Choice electricity or wind/solar energy. [8]

KRAV also has an ecolabel that is awarded if a store has a certain range of KRAV-certified products and handles products so that they are not mixed with traditionally produced food. Further, staff in the shop must be knowledgeable about organic cultivation and KRAV regulations. [9]

Norway

The official Norwegian organic label, Debio, focuses on the certification of organic products. Debio therefore collaborates with grocery stores encouraging them to sell more organic products. But the label itself does not apply to grocery stores.

In Norway the Eco-Lighthouse Program [10], which is a simple certification system for small and medium-sized companies, has criteria for grocery stores.

The stated goal of the Eco-Lighthouse Program is to produce environmental standards for as many private and public operations as possible. In the private sector, the program is aimed at all companies in industry, transport, retail and service sectors. [10]

Companies that perform an environmental analysis and fulfil defined trade requirements can be certified in the Eco-Lighthouse Program. The Eco-Lighthouse Program is a private Norwegian certification system aimed primarily at environmental management processes. Since 2001, the program has also set simple requirements of the product range offered by grocery stores.

Denmark

There are no competing ecolabels for grocery stores in Denmark. There are several local environmental organisations that have established ecolabelling initiatives to promote stores in areas such as Odense, Kolding and Århus. These do not however meet the standards of ecolabels proper.

Energy Service Denmark “Grøn Butik” concept [33]

The Grøn Butik (Green Store) concept is based on a dialogue and continual improvement. It can be applied to a wide range of stores from ice-cream vendors and grocery stores to cafés. The store identifies the areas with which to work. The store continues to be affiliated to Grøn Butik so long as it makes annual environmental improvements or can document which actions it has attempted to take. A Grøn Butik labelled store must receive energy advice but this is not a concrete requirement regarding improvement.

Facts about Grøn Butik

Common minimum requirements:

- The licensee must specify at least three action areas each year in advance for which improvements shall be made in comparison to the store’s current position.
- Grøn Butik’s consultants shall visit the store and inspect both the energy consumption and environmental conditions.
- The action areas must be within the following fields: electricity, water, heating, green purchasing, product range, waste and transport. The action areas must be spread over at least two of these fields.
- A store that does not observe the environmental legislation and municipal commercial waste regulations must take actions to rectify this within three months.
- Improvement work is checked each year after which the store owner submits three new action areas.
- A store that does not improve within its action areas within the space of one year or that does not document how it has attempted to improve is not permitted to renew its Grøn Butik diploma.
- In every Grøn Butik project, local guidelines are defined within the framework of the national concept. The local regulations must be published on the projects’ own websites.

Source: www.groenbutik.dk

In Denmark, the EMAS and ISO 14001 environmental management systems are used besides ecolabelling. These systems can be used by stores to structure environmental work and thereby achieve their environmental objectives. But with

these environmental management systems, the store itself sets its environmental objectives.

Finland

In Finland the KESKO store chain has its own environmental certification for which the store has set the requirements.

2.2 Justification for the Nordic Ecolabel

Ecolabelling shall give the grocery store an overview for the grocery stores environmental impact and give grocery store a tool to reduce its environmental impact. Ecolabelling shall also guide consumers to choose environmentally suitable goods and services in preference to other goods and services. Ecolabelling shows the consumer which goods and services are among the most environmentally suitable.

The consumer should also be able to make this choice regarding grocery stores. Many consumers probably already know which stores hold the largest and best range of organic and ecolabelled products. Few consumers, however, are familiar with other aspects of a grocery store's environmental impact, such as energy consumption and waste handling. The Nordic Ecolabel can provide the consumer with sound facts and thus a real choice.

2.3 Nordic Ecolabelled stores in the Nordic region

Since Nordic Ecolabel criteria for grocery stores were first published, many stores have been awarded licences. There are presently a total of 447 Nordic Ecolabelled grocery stores: 20 in Finland, 45 in Norway and 382 in Sweden.

3 Market

3.1 Market statistics

The Nordic market is sufficiently large for many players, which means that ecolabelling can provide a competitive advantage. The local markets are described in more detail in the following section.

Denmark

The Danish market is highly divided. There are discount stores and traditional stores that focus on quality and a large range of organic and ecolabelled products. The latter are primarily found in the Copenhagen area and large towns while there are nationwide and regional discount chains. But the stores' market share is constantly changing. In 2007, the discount segment held 28.8% of the grocery market. This share is growing and is forecast to reach 40% in several years. In an attempt to retain market share, supermarkets have introduced low-price products. "Gul pris" is a group of selected low-price products in Spar stores, while X-tra is Coop's low-price range in SuperBrugsen, Kvickly och Kvickly Extra stores. [34] (Source: <http://www.business.dk/article/20081130/detail/711300099/>)

The growing share held by discount stores is not at the expense of organic products. In 2008, Danish Organic forecast that sales of organic products would be up 25% on 2007. Organic products are thus estimated to account for 6.5% of total food sales with a turnover of DKK 4.5 billion. The increase in sales of organic products is primarily in discount stores [35]. Regarding ecolabelled products, an analysis by AC Nielsen shows that ecolabelled products accounted for 16.5% of Danish grocery sales in 2007.

COOP

Coop Danmark operates the Kvickly, Kvickly xtra, SuperBrugsen, Dagli'Brugsen and LokalBrugsen chains as well as NETtorvet and the subsidiaries Fakta A/S and Irma A/S. Coop Danmark has, together with the independent consumer associations, an annual turnover of approximately DKK 40 billion and 27,000 employees. Coop Danmark is owned by FDB, which has 1.6 million members.

Kvickly: 65 superstores with little focus on the supply of organic products.

Kvickly xtra: 14 stores

Super Brugsen: 267 stores making it Denmark's largest supermarket chain.

Dagli'Brugsen: 345 stores, convenience store chain.

Lokal Brugsen: 41 grocery stores, food is the main focus of the product range.

Irma: 72 grocery stores with a focus on special and quality products.

Irma City: 5 stores all in Copenhagen. Smaller, sister company with Irma. They focus on a niche of take-away and ready-made meals.

Fakta: 351 stores, discount chain.

NETtorvet: NETtorvet is Coop Danmark's online store with products that are not available in Coop's physical stores. At NETtorvet, the buyer reserves items from home and then collects and pays at their local store.

Dansk Supermarknad

Dansk Supermarknad is owned by [A. P. Møller-Mærsk](#) and the F. Salling Group and currently consists of seven retail chains and two department stores, which provide customers with groceries and non-food items. Each chain has its own profile but has common purchasing, IT, finance and warehouse functions. Dansk Supermarknad has more than 1,100 stores in five countries and an annual turnover of more than DKK 66 billion including VAT.

Føtex: 78 stores. The price level is typical for the competition. Føtex stocks a wide range of brand and own-brand goods. Føtex places great importance on product quality. The fresh produce offered to customers is of a quality expected of the best speciality stores.

Bilka: 14 stores. The stores, with few exceptions, are located out-of-town close by to major towns and cities. Bilka stores have an extensive full food range, a wide range of non-food items, bakery and delicatessen departments and restaurants and cafés.

Netto: A discount chain with 363 stores including 28 “døgnNetto” stores primarily located in Copenhagen. 60% of products are common to both store concepts. døgnNetto has a special focus on brand goods, in particular sweets, snacks and fresh foods.

Salling: Superstore with 2 stores. Products primarily within the following categories: textiles, personal hygiene, ironmongery, sports equipment and foodstuffs.

Dagrofa

The Dagrofa group comprises both a retail and a wholesale division.

SuperBest: Chain with approx. 220 supermarkets.

Dagrofa S-Grossist A/S: Chain with 29 wholesale stores. Extensive grocery range.

SuperGros A/S: Major grocery wholesaler.

Kiwi minimpris: Discount chain with approx. 34 stores in Jylland.

Alta: Discount chain with 28 stores in Jylland and Fyn.

SPAR: SPAR in Denmark has roughly 450 stores with three different profiles: SUPER SPAR, SPAR and KWIK SPAR.

Independent grocery stores:

Mad & Vin

Delicatessen supermarket in Magasin in Copenhagen and Lyngby.

Egefald

Egefald is a supermarket solely offering organic foodstuffs. Other products, such as personal hygiene products and cleaning agents, are environmentally conscious and if possible ecolabelled.

Egefald provides the same wide range of products as other supermarkets with the difference that all products at Egefald are organic. With a range of some 3000 different products, you will also find products at Egefald not found in most other stores.

Årstiderne

Internet store that delivers organic vegetables to 40,000 households in Denmark and 6,000 households in Sweden. The firm cultivates, packages and distributes the vegetables.

Aldi

International discount chain with roughly 250 stores in Denmark.

Lidl

Lidl is one of Europe's largest discount chains with over 7,000 stores. Denmark currently has roughly 60 stores.

REMA 1000

REMA 1000 is a chain of discount stores that was established in Norway in 1948. The first REMA 1000 store in Denmark opened in 1994. There are currently over 150 REMA 1000 stores in Denmark. All REMA 1000 stores are run on a franchise basis.

Hørkram Schulz Food Service

A nationwide full supplier of foodstuffs to professional catering and restaurants. They also have an online store for trade.

Inco

Inco Denmark is a full supplier to retail food stores with more than 25,000 articles. Product areas include: meat, seafood, colonial products, frozen food, dairy, fruit and vegetables, and non-foods. Inco has many organic foodstuffs.

Finland

Finland has three large grocery store chains: The "K" group (K-citymarket, K-extra, K-market, K-Supermarket, other), the "S" group (Prisma, S-market, Alepa+Sale, other), and Tradeka (Euromarket, Siwa, Valintatalo). In 2007, the market share for grocery stores was as follows:

K group	33.9 %
S group	41.0 %
Tradeka:	11.9 %
Lidl	4.7 %
Stockmann:	1.5 %
M chain	0.8 %
Miscellaneous	6.0 %

The size of the grocery market in 2007 was €22.4 billion. Retail sales accounted for €13.0 billion (58%). Sales to restaurants and cafés amounted to €4.1 billion (18.5%). Kiosks, petrol stations, markets, street vending, etc. totalled €2.1 billion (10%). There were 3,922 stores.

Norway

Total net turnover in 2007 was NOK 117,007 billion.
See Figure 1 for the market share of the chains.

Market share of parent groups in 2007 (change 2006-2007)

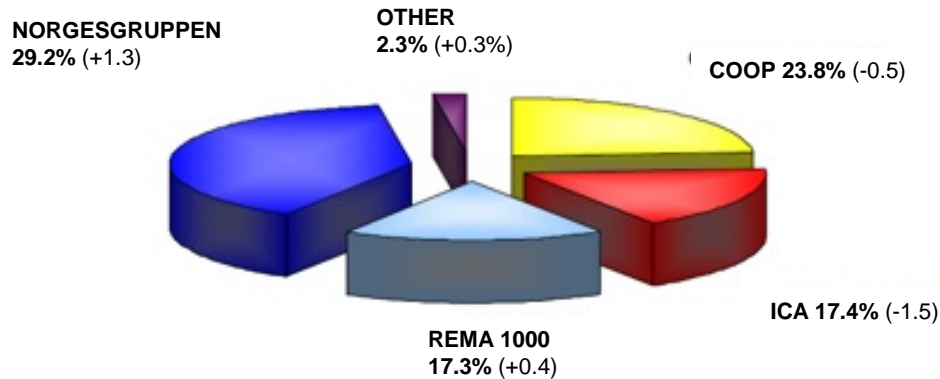


Figure 1: The Norwegian market has four major umbrella chains. Source: AC Nilsen Norge AS, Press release 28 March 2008 on "Grocery report 2008".

Norgesgruppen, Coop, ICA and Rema 1000. Norgesgruppen owns the chains Kiwi, Meny, Spar, Bunnpris, Joker and Ultra/Centra. As of 11 December 2008, Norgesgruppen had ecolabelled 3 Ultra and Meny stores. Coop owns the chains Coop Obs!, Coop Marked, Coop Mega, Coop Extra and Coop Prix.

As of 11 December 2008, Coop Norge had ecolabelled 35 stores. The entire Coop Extra chain, with 8 stores, is ecolabelled. ICA has the ICA Maxi, ICA Supermarked, ICA Nær and Rimi chains. REMA 1000 is a chain of low-price stores. German Lidl has attempted to enter the Norwegian market for several years but has not managed to gain more than a small percentage of the market. In March 2008, all 50 Norwegian stores were sold to REMA 1000. Coop, as the name suggest, is a co-operative, while the other chains are privately owned.

Online stores with home delivery have so far won little market share in Norway.

Interest in ecolabelled stores has increased in Norway. Ecolabelling Norway expects this rise in interest to continue in 2009.

Sweden

The Swedish grocery market is dominated by three chains: ICA, Axfood and Kooperationen. Table 1 shows that, including the Berghendahl sphere, these 4 players hold almost 75% of the market.

Table 1: Turnover of Swedish grocery chains.

	No. of stores	Turnover (SEK million)	Turnover (%)
Ica	1390	80895	36.5
Axfood	730	30429	15.9
Kooperationen	720	35216	13.7
Bergendahlssfären		13501	6.1
Miscellaneous	2080	61496	27.8
Total	4930	221537	100

Source: Marknadsguide Dagligvaruhandel 2007, Market

Table 2: Wide range of store turnover

Turnover (SEK million)	No.	Market %
3 - 7	1425	29
8 - 19	1280	26
20 - 49	1200	24
50 - 74	370	10
75 - 199	470	7
200 -	175	4

Source: Marknadsguide Dagligvaruhandel 2007, Market

3.2 Market analysis

Trend

The grocery industry has in recent years become more globalised with a trend of larger chains growing even larger through the acquisition of smaller actors. The background to this development is a wish to gain a competitive advantage and win new market. For small chains, this means there is an even greater risk of losing market share.

Despite the growth of the size of the chains, there are many store concepts and types within each chain. Further, store managers and shopkeepers have a relatively large degree of freedom to take decisions at a local level. For example, it can be a local decision as to whether to ecolabel the store.

Online groceries sales are currently relatively small. Many of the grocery chains that have started web stores have since phased out this service due to a lack of demand.

Coop has re-launched its online store "Mataffären" and there is a strong trend with stores such as "Ekolådan". New sites such as www.mathem.se are developing in Sweden.

Organic foodstuffs and ecolabelled products

Since version 1 of the criteria was adopted, the availability of organic foodstuffs has generally increased in the Nordic countries, with the exception of Finland. Organic food is fashionable in all the Nordic countries. The supply and demand of organic foodstuffs has however not risen in Finland.

Of the European member states, organic foodstuffs have the largest market share in Denmark, Sweden, Austria and Switzerland. In Denmark, organic sales accounted for 5.8% of the market in 2007. In Sweden, the equivalent proportion was 2.6% in 2005. In these countries, the supply of organic food has risen dramatically in recent years. For example, sales volumes of organic food rose 65% between 2003 and 2007 [36].

The supply of organic foodstuffs in Finland has not risen since 2003. There is currently a declining trend regarding organic food sales in Finland. The supply of organic meat and eggs has recently declined steeply. However, the availability of Fairtrade products has risen considerably in Finland.

In the Nordic countries, the availability of ecolabelled products has increased. Since 2003, when the first criteria for grocery stores were adopted, the supply has increased continually. There are currently 447 licenses in the Nordic region.

There are significant differences in the availability of organic and ecolabelled products (e.g. household chemicals) in stores in the Nordic countries. Subsequently, Nordic Ecolabelling has decided to set different product range requirements in the different Nordic countries.

4 Environmental impact of grocery stores

Customers in a Nordic Ecolabelled grocery store must be sure that they are shopping in a store that has minimum environmental impact. The preliminary study ahead of criteria development concluded that grocery stores cause a significant environmental impact that can be reduced through ecolabelling. The many stores that now have a licence confirms that Nordic Ecolabelling made a correct assessment that there are large environmental benefits to gain by collaborating with Nordic Ecolabelling in the grocery sector.

The project group believes that the segmentation and RPS study performed during the initial criteria development is still applicable.

Nordic Ecolabelling sets requirements in eight areas based on work performed by the national work groups during the development of version 1 of the criteria, the secretariat group's consultation with branch experts and literature research. These are:

- Product range
- Energy and climate impact
- Waste management and packaging
- Transport and distribution
- Refrigeration and freezer equipment
- Consumables
- Working environment
- Quality

The following section describes these eight areas with regard to environmental relevance (R) and the potential for environmental gains in the area (P). Section 5 of this document describes how Nordic Ecolabelling can stimulate environmental improvements in the areas through requirements in the criteria document for the ecolabelling (S). R, P and S stand for relevance, potential and steerability. Water consumption is also covered both here and in Section 5, since it has been discussed during criteria development whether this parameter should be included. The draft criteria do not include requirements on water consumption. The following section describes why.

Product range

During criteria development, all interested parties placed great emphasis on the requirements regarding product range. This is primarily since the production of the products stocked by the store often accounts for significant environmental impact from farming and industry. The environmental relevance (R) is high. Product range is also central to the consumer when shopping. Subsequently, product range has an important role in the Nordic Ecolabelling of grocery stores. The consumer must clearly perceive that they are in an ecolabelled store. We assume that stores have the opportunity to widen their range and promote the sale of ecolabelled and organic products, meaning that the potential is also high (P). The relevance and potential regarding product range are described in more detail and references provided in the preliminary study for the ecolabelling of grocery stores.

Energy consumption

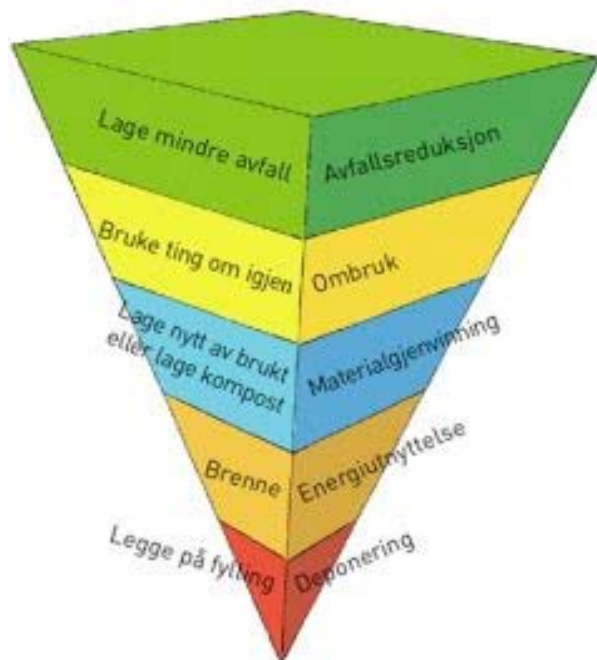
Energy consumption is a significant source of environmental impact (R) since a grocer store consumes a relatively large amount of energy due to its lighting, ventilation and refrigeration [4, 5, 18]. This cause of environmental impact is central and both the national working groups and secretariat group consider it feasible for stores to reduce their energy consumption (P). In addition, it lies in the stores' economic interests to reduce their energy consumption.

Water consumption

The secretariat group has concluded that water consumption in a grocery store is not a significant environmental issue (R) in relation to other environmental parameters such as product range, energy consumption and waste. Accordingly, the secretariat group has decided not to include a requirement on water consumption in this criteria document. It is possible for stores to reduce their use of water (P), but since consumption is generally low [18] there is no reason to focus on this area. The national working groups were in agreement on this point during the development of version 1 of the criteria (see Section 5 in the associated background document).

Waste management and packaging

The waste hierarchy, or waste pyramid, provides an overview of how the authorities prioritise waste management. See Figure 2.



Hierarchy of waste management strategies:

1. Waste reduction
2. Reuse
3. Material recovery
4. Energy recovery
5. Landfill

In brief: we should choose the strategies that are the most environmentally suitable and minimise the use of less environmentally suitable strategies. To limit the quantity of waste that is sent for energy recovery and landfill, stores must reduce waste production by sorting waste into fractions that can be reused or recycled.

Figure 2: The waste hierarchy or “waste pyramid”

Source: <http://beta.sortere.no/kildesortering/avfallspyramiden> 2009-06-11

A grocery store uses much packaging and produces large amounts of waste. This constitutes a significant environmental issue (R) since waste management has problems keeping pace with waste production, of which packaging is a major source [19, 20]. Spoilage of goods is a major problem in grocery stores and causes unnecessary CO₂ emissions. By reducing its quantities of spoilage, the store can reduce its environmental impact. During the initial development of the criteria, both the secretariat group and the national working groups assessed that it is possible for stores, together with their suppliers, to reduce the use of packaging and also develop better solutions for the handling of waste through reuse in collaboration with waste contractors (P). It is of course a prerequisite that the store follows regulatory requirements and that all hazardous waste is handled according to current regulations and legislation. The grocery stores are excepted to follow national laws for handling dangerous waste.

Transport and distribution

Transport is one of the major sources of pollution to air in the Nordic countries [21, 22]. The transport and distribution of groceries from the producers, suppliers and warehouses to the stores thus has a significant environmental impact (R). Goods are most often carried by diesel truck [21] which emit both particles and polluting chemical substances to the air [21, 22]. There are many ways to reduce quantities of air pollution (see Section 5 of the background document relating to criteria version 1). It is considered possible for the stores/chains themselves to take measures promoting this reduction. But as is described in Section 5 of the background document to criteria version 1, it is also difficult to set requirements on goods transport and distribution in the criteria document. Stores have limited scope to steer (S) the environmentally most significant transports.

Refrigeration and freezer equipment

The two primary environmental aspects of refrigeration and freezer equipment are energy consumption and ozone depleting refrigerants and insulating materials [5]. Despite developments in this area to reduce the environmental issues, many grocery stores have equipment with ozone depleting refrigerant, ozone depleting insulation and relatively high energy consumption (R). Moreover, they often have problems with refrigerant leakage [5]. The secretariat group and the national working groups that developed the first criteria version were unanimous that only relatively simple measures are required to reduce the environmental impact of refrigeration and freezer equipment (P). The store's opportunities in the short term to change refrigerants is limited. It is however possible to reduce leakage and optimise the energy consumption of the refrigeration system.

Consumables

A grocery store uses considerable amounts of consumables, such as toiletries, cleaning agent, office supplies and printed advertising. Such items have an environmental impact, though minor, during production, use and waste management (R). There is however great scope (P) to use more environmentally conscious products (ecolabelled products) and there are therefore good grounds to set requirements on these products. There is, for obvious reasons, limited scope for the criteria to steer the packaging that is used. There is a desire to limit the use of packaging and to promote the use of environmentally suitable alternatives. It must however not be forgotten that packaging fills a function, such as to extend the shelf life of foodstuffs or to enable efficient transport. Accordingly, the choice of packaging material should not be limited in certain areas. This could otherwise cause increased spoilage and thus a greater CO₂ burden and lower profits.

Working environment

The secretariat group investigated the relationship between the store's inner and exterior environment (the store's working environment) when the initial criteria were established. The investigation found that the working environment often has an influence on quality, store control and staff input. These factors are also important to target-oriented work with the store's environmental impact. The working environment also influences the customer's perception of the store. It is important that Nordic Ecolabelled stores maintain a certain standard so that the ecolabel is also a mark of quality. Therefore, improving the working environment can also be seen to help improve the environmental aspects (R). It is however difficult to set requirements on the working environment that are also simple to check and that do not create unnecessary administration (P).

Quality

As also described above regarding the working environment, Nordic Ecolabelling believes that there is a correlation between environmental impact and quality (R). It is not enough to have control over environmental aspects for a consumer to choose a store, the store must also maintain high standards. It must not be the case that Nordic Ecolabelled stores are perceived as of a lesser standard than other stores. Simple requirements on quality management in the store can ensure that this goal is attained (P).

5 Background to requirements and criteria

Grocery stores in which groceries account for more than 50% of turnover on an annual basis can apply for the Nordic Ecolabel.

An important aspect of this revision has been to minimise the administration for the store. The section below describes the background to the requirements in the criteria document.

5.1 Important information about the store

Section 1.1 of the criteria requires a description of the store to give a clear picture of the business. The store is required to specify:

1. *Number of employees:* The number of employees at the store is required since procedures regarding environmental management, working environment and staff training depend on the number of employees.
2. *Size:* This parameter influences the store's energy consumption. Size refers to the indoor floor area. Areas such as a loading platform and car park are not included.
3. *Location:* The store's location influences its capabilities to accept goods via different means of transport, to deliver goods and to provide parking (including cycle parking). In addition, the store's energy consumption is influenced by the store's geographic location and climate zone, and whether the store is stand alone or one of several retail units in a premises.
4. *Type of store:* The product range held by a store varies with the type of store. This influences factors such as the energy consumption of the store.
5. *Group or chain of stores:* It is important to know whether the store is part of a larger group since this influences requirements set of the store but that are decided on at a group-wide level. Examples include product range, advertising material, the purchase of refrigeration units and marketing using the Nordic Ecolabel.
6. *Turnover:* Information on the store's turnover is essential for the requirements on product range and waste management.
7. *Number of products and product categories:* Information on the number of products is required for the requirement on product range since this requirement varies with the number of products stocked by the store.

5.2 Product range

The product range held by a store may have a negative impact on the environment in several respects. For example, goods production may require large amounts of

energy, may use environmentally hazardous materials or may use chemicals that have negative consequences for the environment when the product is retired.

The criteria include a product points system. The store must achieve a set score by stocking a range of ecolabelled and organic products. A product is defined by its trade name and commodity number. A single product must only have one commodity number. In addition, points are awarded for not selling certain products that may cause environmental issues related to production, use or waste management.

Product categories have been added to the Nordic Ecolabelling requirements since there is now a greater range of ecolabelled and organic products. The requirements on product points vary between Nordic countries since the availability of organic and ecolabelled goods varies.

Point system for product range

The requirement on the store's product range depends on its turnover. It is easier for a large store to have a wide range of organic and ecolabelled product than a small store. Points are awarded for a range of product categories for the number of organic, ecolabelled and Fairtrade products that the store stocks. The score and limit values are based on the availability of organic and ecolabelled products on the market and an evaluation of the environmental relevance of each product category. The number of products within each category has been investigated in each country. The score that the store achieves must then be compared to limit values that depend on the store's turnover and number of product categories. The criteria list 24 product categories.

The requirements vary between Nordic countries since the availability of organic and ecolabelled goods varies. By setting ambitious requirements, Nordic Ecolabelling can help improve the availability and use of organic and ecolabelled products in all the Nordic countries.

The limit values required for a certain store are based on a survey of stores in the Nordic region. The limit values vary for the different countries due to variations in the availability of organic and ecolabelled products (e.g. household chemicals) in stores in the Nordic countries. Subsequently, Nordic Ecolabelling has decided to set different product range requirements in the different Nordic countries.

To enable the use of one table with one currency, we have chosen to use euro. We have chosen a fixed exchange rate for the Nordic currencies so that the requirement limits do not vary with changes in exchange rate. We have decided to use a fixed exchange rate between euro and Norwegian krone of 8.1 and between euro and Swedish krona of 9.2, based on an average from 1999-2009.

Minimum number of product categories containing organic and ecolabelled products

There is a limit value for the minimum number of product categories that a store must stock. The lower limit is nine (50% excluding "other organic or ecolabelled products"). In addition, at least five of the listed product categories must be foodstuffs. This is so that the store is rightly classified as a grocery store.

Minimum number of organic/ecolabelled products

The secretariat group believes it is important to the consumer in a Nordic Ecolabelled store that there is a varied selection of ecolabelled and organic products.

Accordingly, the criteria require that at least 70% of the product categories shall contain at least one organic or ecolabelled product. This requirement is unchanged.

Fairtrade

Fairtrade, though more focused on social sustainability than ecological sustainability, is still a relevant parameter. The Fairtrade label is accepted by the European Commission as a tool for sustainable procurement [42]. Further, there are 24 product categories, so the inclusion of Fairtrade is not a deciding factor for the point score for product range.

Other products (P3-P6)

The store is awarded points if it complies with set product range requirements. These point score requirements are: not stocking goods containing more than 0.5% active chlorine; not selling weed killer; not selling goods containing PVC; and not selling seafood that is on the WWF red list. [43]

Clear display of organic and ecolabelled products (O3)

A very important requirement that directly influences the sale of organic and ecolabelled products is that on the clear display of organic and ecolabelled products. Experience shows that it can be very difficult to live up to this requirement for certain product groups, such as dairy products which are stacked very closely. The basis is that products must be clearly marked either individually or in groups. If this is not practically viable, exceptions may be made. It is difficult to evaluate, check and document exactly which products are exempted from the requirement. A rule of thumb is that most organic and ecolabelled products can be exempted from the requirement.

5.3 Energy consumption

The energy requirements have been revised in the new version of the criteria. Nordic Ecolabelling prioritise energy efficiency above environmentally suitable energy sources in the criteria. This is in line with the Kyoto Pyramid (see Figure 3), on which the energy requirements for grocery stores are based. Through good energy efficiency, the store is well equipped to limit its impact on the environmental aspects associated with energy consumption.

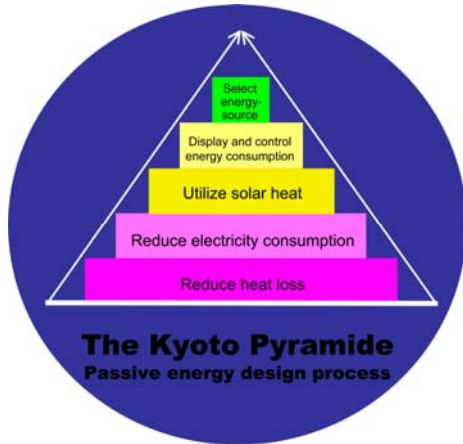


Figure 3 Kyoto Pyramid showing the prioritisation of energy measures.

Nordic Ecolabelling has developed a calculation tool for grocery stores that estimates the store's energy consumption and TEWI (total equivalent warming impact). The purpose of this tool is to evaluate stores based on their actual energy consumption and carbon dioxide emissions independent of the equipment and technology that is used. By assessing the end results, rather than how these are achieved, allows the store greater freedom while still requiring that equipment functions efficiently.

Regarding carbon dioxide emissions, the term TEWI is used. TEWI – Total Equivalent Warming Impact – takes into consideration the emission of greenhouse gases that can be attributed to the facility over its entire service life. In other words it is the carbon dioxide equivalent of electricity, fuel and refrigerant leakage.

The calculation tool is based on the store's energy consumption for heating, ventilation, lighting, refrigeration and freezer equipment, and other equipment that requires energy such as bread ovens and heated displays. The calculation tool produces target values for the store's energy consumption and TEWI based on the design of the store (area, refrigeration system, location, equipment). The target value is a realistic figure for an equivalent store that uses modern equipment and technology. The store's actual electricity consumption and energy and fuel consumption for heating is then entered into the tool. The results are then compared with the target values. This energy calculation tool and methods of calculation are described in more detail in Appendix 1.

The calculation tool has been tested on a limited number of stores in the Nordic region. All the tested stores exceed the target values by some degree. See Figure 1 below. Most stores currently exceed the target values for two main reasons:

- The store's equipment uses old technology.
- A lack of know-how regarding the store's energy consumption.

Store personnel and other maintenance staff are seldom aware whether the store is energy efficient. Further, the equipment and service companies that they traditionally use often lack expertise on a store's total energy consumption. A store most often has different suppliers and servicing companies for refrigeration and freezer equipment, heating, ventilation and lighting. This often means that the systems are

not optimised for running together. The systems may “counteract” leading to unnecessary energy consumption.

According to the calculation tool, the majority of stores can reduce their energy consumption and carbon dioxide equivalents by using energy-efficient equipment in the areas of refrigeration and freezing, heating, lighting and ventilation. There are great economic and environmental gains to be made here.

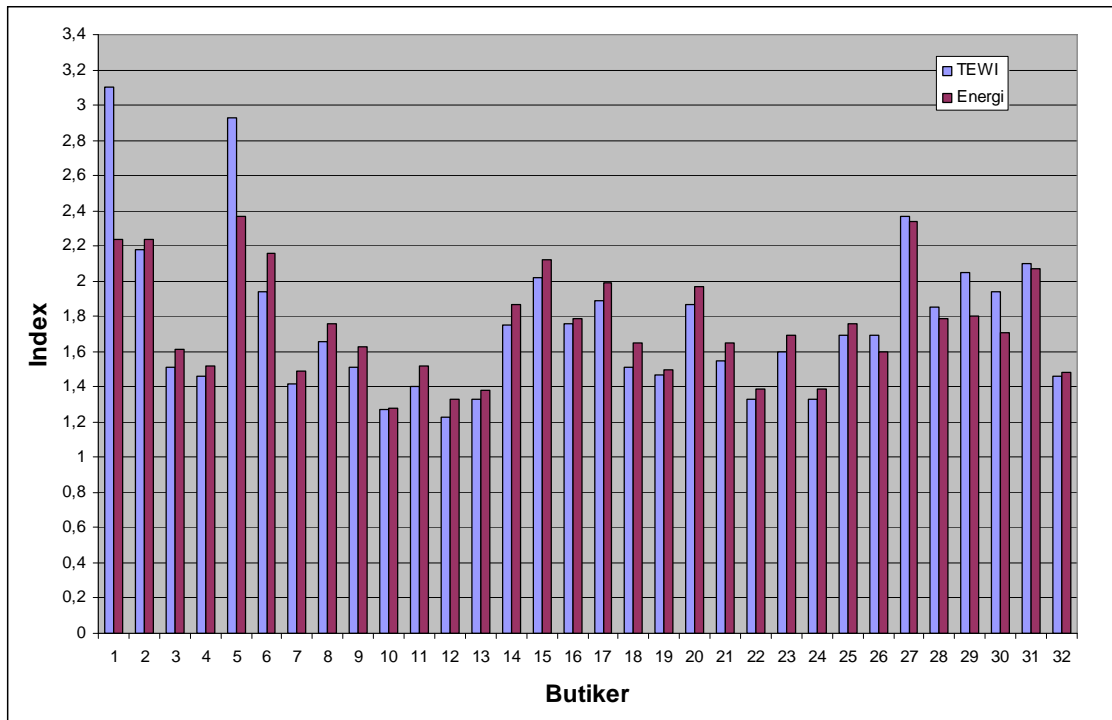


Figure 1: Energy consumption and TEWI of Nordic stores from test performed April-May 2009. The stores are evaluated using the calculation tool, which estimates the energy consumption and climatic impact (TEWI) that a store can have under optimum conditions.

This is a new requirement and the calculation tool is new. Nordic Ecolabelling has therefore chosen to set an absolute requirement of a factor 2.00 in this criteria version. This means that the store’s actual energy consumption must be less than 2.00 times the target value calculated using the energy tool. Accordingly, a store that has a target value of 1,000,000 kWh must have an energy consumption below 2,000,000 kWh. This limit may be considered high, but Nordic Ecolabelling has chosen to adopt a moderate limit value in this draft.

During the referral period, trials shall be run at more stores to gain a greater understanding of the energy consumption and TEWI of grocery stores. Following these trials, the limit value can be adjusted. Requirements are also set regarding actions to reduce energy consumption (O4-O6).

The point score requirements on energy (P7-P8) mean that stores with a high energy consumption or TEWI must compensate with high scores regarding waste, transport and product range. To encourage stores to keep check of energy consumption, there

is a point score requirement (P9) for monitoring energy consumption and establishing an action plan to reduce this.

5.3 Refrigeration and freezer equipment

To reduce the energy consumption of Nordic Ecolabelled stores, Nordic Ecolabelling requires that freezers and refrigerators are covered when the store is closed (O6). Covering reduces the cold escaping from the units and thus lowers energy consumption. This requirement also applies to plug-in freezers and refrigerators if these comprise a significant proportion (more than 10%) of the store's refrigeration systems.

The criteria also have a point score requirement concerning the refrigerant that is used in remote freezer and refrigeration systems. Using a refrigerant with low GWP reduces the greenhouse effect when the refrigerant leaks. The greenhouse effect is measured using a carbon dioxide equivalent known as Global Warming Potential (GWP).

5.4 Waste

The background to evaluating waste management is founded in the waste pyramid shown in Figure 2 and the European Commission waste directive from 2006, Article 3a.

Grocery stores produce large amounts of waste. There are four main sources of waste:

- Food that is thrown away as it is no longer fit for consumption.
- Packaging used to transport goods to the store.
- Miscellaneous waste: from cleaning, store maintenance, shelving, etc.
- Hazardous waste

Stores are assessed with regard to two aspects:

- How much waste goes to landfill or incineration.
- The number of factions into which the store sorts waste.

The purpose is to:

- Reduce the amount of waste that is produced.
- Make sure that waste that is produced is sorted to facilitate reuse and recycling.

It is of course a prerequisite that the store follows regulatory requirements and that all hazardous waste is handled according to current regulations and legislation.

Unsorted waste (O7 and P11)

The purpose of these requirements is to minimise the amounts of waste. The draft criteria contain a limit value for how much unsorted waste is sent to landfill or incineration (O7) and a point score requirement awarding stores with efficient waste management (P11). Compliance with the limit value for waste quantities can be replaced by the store demonstrating that a maximum of 25% of the store's waste is unsorted. This requirement has been tightened from 35% to 25% in the draft criteria. When calculating the percentage of unsorted waste, transport waste and return packaging is to be included.

This requirement is new in this draft version. Nordic Ecolabelling is not sure about the limits in the requirement. The data for the draft shows that the waste from grocery stores varies in the Nordic countries. The possibilities to sort waste is different is also different in the Nordic countries. Nordic Ecolabelling needs more data for the requirements and this shall be gathered during the draft period. We specially ask you to comment the requirement O7 and P11.

The possibility to sort waste varies greatly between stores but the ability to fulfil the requirement is considered good for most stores. We have however identified two factors that lie outside the control of the store and can present a challenge to some stores.

- 1) If the store is located in a region in which it is not possible to deposit unsorted organic waste for biological treatment, this can considerably impede the store's ability to fulfil the requirement. This is since organic waste is relatively heavy and if there is not the possibility to sort organic waste, it may also be very difficult for the store to fulfil the requirement.
- 2) If the store is located in premises which for food hygiene reasons are not suitable for the separate handling of organic waste, exemption from the requirement may be granted.

Waste from the store's preparation of food or from a restaurant open to the public may be deducted if the store can declare quantities. The waste from a restaurant is deducted since the restaurant is beyond the store's core activities.

Sorting at source of store waste (O8 and P12)

The draft criteria also include requirements that the store must sort waste for recycling, and a point score requirement that favours stores with efficient sorting systems that reduce waste and increase recycling. Requirement O8 includes the waste fractions that large grocery stores normally use and that can be processed in the Nordic region. The store must sort waste into at least four out of six fractions. Not all stores are able to sort waste into all the six fractions that are specified. For example, it is not possible for all stores to sort organic waste. How the waste fractions are processed depends on the location of the store. Waste processing varies over the Nordic region and it can even vary locally within the different Nordic countries. Therefore, stores shall sort waste into four out of the six fractions.

The waste pyramid shown in Figure 2 and the European Commission waste directive of 2006, Article 3b, provide the background for promoting the sorting of waste into fractions.

This requirement takes into account differences in food prices between the Nordic countries. We have decided to use a fixed exchange rate between euro and Norwegian krona of 8.1 and between euro and Swedish krona of 9.2 (based on an average from 1999-2009).

Sorting at source of customer waste (O9 and P13)

Nordic Ecolabelled stores shall provide their customers facilities to sort waste such as packaging. There is an obligatory requirement regarding information to customers and a point score requirement that awards stores points depending on how many waste fractions can be sorted at the store.

Organic waste (P14)

The limit values differ between Nordic countries since the requirement is relative to the store's turnover and since food prices vary. Since food prices are higher in Norway than Finland, for example, a Norwegian store produces less waste per euro than a Finnish store.

Since the requirement is relative to the store's turnover, the large variation in food prices between countries has been taken into account. If major price alterations should occur during the validity of the criteria due to high inflation or changes in VAT, the requirement may be adjusted.

The draft criteria include a point score requirement for waste that awards stores that reduce their quantities of unsorted waste.

Points are also awarded to stores that sort organic waste for rotting or composting. Unsorted organic waste scores additional points primarily since its handling is time consuming and thus resource intensive for the store to sort food waste from packaging. Another important reason is since the waste, following biological treatment, can be returned to agriculture. In 2007, 336,100 tonnes of biofertilizer were returned in Sweden [38]. The rotting and composting (biological treatment) of waste is becoming increasingly commonplace in Sweden. These processes produce usable residual products. Rotting also produces energy in the form of biogas. Sweden has environmental goals to increase the biological treatment of food waste. Although as a whole recycling waste is beneficial, composting and rotting can have negative effects on the environment. Accordingly, the Swedish Environmental Protection Agency has produced guidelines with preventative actions to reduce the environmental impact of organic treatment. [39]

It should be noted that there are studies that show that composting is not necessarily more environmentally suitable than incineration with energy recovery for electricity or district heating [42].

Many incineration plants welcome organic waste in their "fuel". It gives a lower combustion temperature than if the fuel did not contain the moist organic waste. Many incineration plants are not designed for the high temperatures that arise without organic waste. The main reason that Nordic Ecolabelling awards points for the sorting of organic waste is that the waste can produce gas through rotting. This is a

very good fuel from an environmental viewpoint. It is difficult to control how the organic waste is processed since the facilities for rotting and composting differ between locations.

5.5 Transport and distribution

Requirements on transport from the store

We have considered awarding points to stores that are located close to means of public transport. This would provide an advantage to stores in urban areas and penalise those in less densely populated areas. Since it is not the place of Nordic Ecolabelling to advocate whether or not grocery stores should operate in sparsely populated areas, where public transport is less developed, we do not consider it relevant to set requirements that benefit stores close to public transport.

Transport to stores

The new criteria for grocery stores come into force in 2010. The previous requirement expires in March 2012. The Euro 5 standard for trucks comes into force on 1 October 2009. All new trucks from that date must comply with the standard. Euro 4 came into force in October 2005, so it is reasonable to assume that there are some trucks that only fulfil Euro 3 standards. The change from Euro 4 to Euro 5 only entails a reduction of the NO_x limit value from 3.5 to 2 g/kWh. This can be achieved with an SCR catalytic converter or a urea pump.

In Denmark, the Road Safety and Transport Agency, in conjunction with the Danish Technological Institute have initiated a voluntary "principle approval" for particle filters for vehicles. The principle approval ensures that the filter system fulfils the Danish Road Safety and Transport Agency's requirements specification. This also means that the filter provides effective particle cleaning, that filter status is continually monitored, that the filter does not produce other pollutants and that the filter manufacturer has taken into regard the working environment for servicing. Link to approved filters: <http://www.fstyr.dk/sw24448.asp>

Requirements on goods vehicles

The criteria set require that the store's own vehicles used for goods transport are serviced regularly. This requirement (O10) is obligatory. The regular servicing of vehicles reduces emissions and also ensures that the vehicle has a long service life. The store must also have a policy that requires that its own vehicles have good fuel returns and for the purchase of ecolabelled tyres to reduce fuel consumption. The draft criteria also contain point score requirements on the fuel used for transport and distribution (P15 and P18) and carriers (P16).

Stores that use Nordic Ecolabelled or renewable fuel are awarded points. The difference between renewable and Nordic Ecolabelled fuel is that the energy efficiency of ecolabelled fuel is guaranteed. Nordic Ecolabelled fuel comprises at least 1/3 renewable fuel and produces a maximum of 50g CO₂/MJ. For these reasons, more points are awarded for Nordic Ecolabelled fuel than renewable fuel under P15 and P18.

Requirement P17 awards points to trucks depending on with which Euro standard class the vehicle complies. The higher the Euro standard the lower the environmental

impact of the vehicle. The Euro standards for heavy diesel vehicles set limits for nitrogen oxide, carbon monoxide, hydrocarbon and particle emissions.

Refrigerant in goods vehicles

Requirement P19 awards points to stores that have carriers using low GWP and low ODP refrigerant. These refrigerants contribute less to global warming and cause less ozone depletion if they are released into nature. The ODP and GWP parameters quantify the depletion of the ozone and emission of greenhouse gases. ODP stands for ozone depletion potential. The reference value is the CFC 11 refrigerant, which has an ODP value of 1. A carbon dioxide equivalent is used to measure the contribution to the greenhouse effect. Global warming potential (GWP) specifies the carbon dioxide equivalent in kilograms that one kilogram of a medium produces. [44] The use of CO₂ as a refrigerant is uncommon. Ecolabelling can be at the forefront of developments in this area and include a point score requirement to promote its use. Though stores do not always have their own trucks, they can influence their carriers.

Requirement P20 awards points to a store that has refrigerator and freezer vehicles with electric power connections. With an electric power connection, the vehicle can turn off the engine and run the compressor on electricity to reduce emissions from the vehicle.

Points are also awarded for stores with charging stations for electric vehicles adjacent to the store. An electric vehicle is an environmentalised vehicle. Providing charging stations at the store facilitates the use of electric vehicles since such vehicles often have a limited range.

Questions to industry

It has been investigated whether it is relevant to demand that trucks are provided electricity when unloading so that the engine can be switched off. Our conclusion, having consulted actors in the industry, is that this is not possible. Trucks often use battery power when unloading. Electricity to the compressor on refrigerator and freezer trucks requires a totally different type of contact and the compressor is switched off during unloading. Nordic Ecolabelling has chosen to set a point score requirement to promote the use of electrical contacts and thus reward carriers that turn off the vehicle engine.

Transport and distribution on which Nordic Ecolabelling does not set requirements

Air freight of foodstuffs

The direct cost of goods transport is small for the majority of products which means that it does not limit the way or distance that products are transported. Even when tomatoes are in season in a Nordic country, tomatoes imported from Sicily can be cheaper. Air freight requires roughly 50 times more fuel than carrying freight by sea. Nevertheless, the threshold is dropping for which products it is profitable to fly to the Nordic region. While air freight was used exclusively for luxury goods, foodstuffs are now also transported by air. One reason is the increased demand for exotic foodstuffs. [36] (Morgenavisen Jyllands-Posten 30.10.2003).

Air freight of organic foodstuffs

Is it sustainable to purchase organic foodstuffs that have been transported long distances by air with the subsequent large fuel consumption? Poor farmers in developing countries have invested time and resources into transforming their agriculture and gaining certification. For them, an export ban would be devastating and ironic. For example, the average consumer in Great Britain has a carbon footprint 30 times larger than the average African eco-farmer.

At the same time, studies comparing, for example, the production of tomatoes and cucumbers in Southern Europe and the Nordic region show that the energy consumption of a heated greenhouse in the Nordic area is far greater than the equivalent outdoor cultivation in Southern Europe, even if transport is included in the calculation. It will always be beneficial from an energy point of view to buy imported tomatoes, peppers and cucumbers rather than Nordic or Dutch greenhouse vegetables, even if these are transported by air. [40]

Accordingly, local vegetables are not necessarily the most climate smart choice. There are many factors besides transport that have an influence, such as whether vegetables are grown in a greenhouse or outdoors, the use of artificial fertilisers and, for livestock, the type of feed. Accordingly, Nordic Ecolabelling cannot apply requirements on regional produce or the prohibition of air freight.

5.6 Consumables

Consumables

This section covers the requirements on consumables that are used in the running, maintenance (cleaning) and marketing (printed matter) of the store. It is important that a Nordic Ecolabelled store sets a good example regarding ecolabelled consumables, packaging with reduced environmental impact, limited chemical use, the use of chemicals and paper with a minimum environmental impact, and so on.

Ecolabelled products (O11)

In general, this requirement has had a great influence on which products are used in-store. It is a very effective requirement. The requirement has been extended to several new product areas, with the reservation that not all Nordic countries have access to ecolabelled products in these areas.

Cleaning agents, hygiene products and paper products

Cleaning agents, paper products and personal hygiene products used by a store must be ecolabelled.

The availability of such products in the Nordic countries is now very good and it is relatively easy to fulfil this requirement. For some areas of a store, however, regulatory requirements may prescribe the use of disinfectants, such as at meat and fish counters and for clearing drains. Such areas of the store are exempted from the use of ecolabelled products as it may otherwise be difficult to fulfil regulatory requirements.

The term cleaning agent is defined so that stores do not need to be acquainted with the Nordic Ecolabel criteria for cleaning agents. The requirement has been developed based on national prerequisites.

Ecolabelled products that must be used:

Floor cleaner, sanitary cleaner, general purpose cleaner, washing-up liquid, hand soap, shampoo, toilet paper, paper towelling and printing paper.

The requirement does not apply if ecolabelled products are not available. Special products that cannot be ecolabelled are not included in the requirement. These include drain cleaner, degreasant, oven cleaner and disinfectants.

Plastic film and gloves (O12 and O13)

PVC

The use of plastic films in the Nordic countries was investigated during the evaluation of version 1 of the criteria. This investigation found that PVC film was commonplace in the Nordic countries while almost completely phased out in other countries. In particular, foodstuffs such as hot dishes, meat, fish and cheese used PVC film as stores found it difficult to find an alternative. A change from PVC to PE (polyethylene) film often requires new packaging equipment. Against this background, the requirements made an exemption to using PVC film for these foodstuffs provided it could be proven that the PVC did not contain phthalates and the store could demonstrate that it worked towards phasing out PVC film.

The present situation in Sweden (2009) is that meat is seldom packed in-store. It is packed centrally using vacuum packing or a protective environment. The film used for packaging “wet” foodstuffs, such as fruit, cheese and meat, in store is however often PVC.

The use of PVC film and PVC-free film for manual packaging in store varies depending on the store’s focus. Stores that handle large quantities of loose foodstuffs prefer using PVC film due to its performance. Stores that only handle small quantities on rare occasions also prefer PVC film since it is significantly easier to work with.

In Denmark, both PE and PVDC films are used. Both Dansk Supermarked and COOP claim to have completely phased out PVC. COOP Trading, responsible for the central purchasing of plastic film for Danish stores, confirms that they use two types of film: a PE film and a PVDC film (Saran film).

One of the large chains in Finland is considering the transition to PVC-free plastic film. This is however not finalised. Tests have not yet found a suitable PVC-free film with the right properties and that can be used in the stores’ packaging equipment. Experiences from Sweden, Norway and Finland also show that PVC-free film is not suitable for juicy fruits and vegetables. Such foodstuffs would require several layers of film.

PVDC film

PVC and PVDC are both types of polyvinylchloride. They are though two different types of plastic. PVDC (polyvinylidene chloride) has double the amount of chlorine and contains much less plasticizer. According to Jens Højslev Pedersen at the Danish Veterinary and Food Administration, PVDC is a type of PVC, which means that when a product is said to be PVC it may be PVDC. PVDC is not considered to be as environmentally hazardous as PVC. It contains double the amount of chlorine but in general PVDC film contains less plasticizer than PVC film. [41]

Experience from Nordic Ecolabelled stores shows that they use both PVC and PE films, depending on what type of foodstuffs are being packed. Nordic Ecolabelling's experiences show that the requirement has limited control and that it is therefore difficult to prohibit certain types of packaging. PVC film must be permitted for certain uses. Other ecolabelling systems, such as KRAV and Good Environmental Choice, have made the same evaluation.

PVC and PVDC film may be used for in-store packaging so long as they do not contain phthalates (O12). Nordic Ecolabelling believes however that it would be good in the long term to phase out PVC film and has thus introduced a point score requirement for plastic film in the draft criteria. Points are awarded to stores that package items without the use of PVC or PVDC films (P22).

Cleaning agents (O14)

Reactive chlorine compounds must not be used. Exception can be made if the authorities have special requirements for cleaning. Reactive chlorine compounds, e.g. sodium hypochlorite or organic chlorine compounds, have a significant negative impact on the environment. These substances are almost always excluded from ecolabelled products.

Cleaning without chemicals (P23)

It is important that a Nordic Ecolabelled store sets a good example regarding the use of chemicals. Cleaning using microfiber cloths can help reduce the quantity of chemicals that are used by the store. Points are awarded if the store does not use chemicals for daily cleaning, such as by using microfiber cloths. This is since such cleaning methods are environmentally more suitable as they can save both water and cleaning agents.

Cleaning without chemicals (e.g. with microfiber cloths) is awarded one point.

Consumables and services (P24) (for use by store)

Purchasing ecolabelled goods and services is awarded points since their low environmental impact is assured. A maximum of four points can be gained. The limit for ecolabelled products has been raised from 10% to 50% or 90%, depending on the product area. Products awarded points in other requirements in the criteria may not receive points under this requirement. A list of eligible products and services is found in Table 4 in the criteria document.

The table also has a row that awards points for other ecolabelled products that are not listed.

Renewable electricity (P25)

Grocery stores use much energy and it is therefore important that there are requirements on energy consumption and CO₂ emissions.

By purchasing renewable electricity, the store indirectly invests in the future production of renewable energy sources that can replace fossil fuels.

This will have a future environmental benefit. It is therefore important to promote the purchase of renewable electricity.

Points are awarded to stores that purchase renewable electricity. This point score requirement is independent of the energy requirements since the calculation tool uses a standard value for electricity, irrespective of its source. This is since the primary purpose of the energy requirements is to reduce energy consumption. We wish to avoid a situation in which a store can compensate for poor/high energy use through the purchase of renewable electricity.

Renewable energy sources are defined by the European RES Directive as wind, solar, geothermal, aerothermal, hydrothermal, wave, tidal, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases.

Printed advertising (P26)

Grocery stores produce much printed advertising and printing's impact on the environment varies significantly with the choice of paper, ink and suchlike.

Accordingly, a relatively high number of points are awarded if the store's own printed advertising is ecolabelled. This also applies to advertising and promotional material sent out by a retail chain if this advertises goods stocked by the store. The entire store chain must be ecolabelled if the advertising includes products that are stocked by an individual store. Printed advertising includes all direct advertising, including addressed such.

The point score depends on the type of printed matter that is ecolabelled. If a store switches to Nordic Ecolabelled printed matter, this change usually applies to the entire chain which produces a relatively large benefit.

The use of Nordic Ecolabelled printing companies is awarded points under P24.

5.7 Environmental management (O15-O23)

All national provisions and regulations must be fulfilled by the store if it is to be awarded the Nordic Ecolabel. This requirement is set to ensure that the store maintains a good standard, which is a prerequisite for the award of a Nordic Ecolabel licence.

Requirements are also set of the store's environmental management and self-inspection. Environmental management is important to ensure the continual revision of the store's environmental efforts and ensure the observance of the requirements in the criteria document.

Accordingly, the store must work systematically with environmental issues and have an environmental management folder with the relevant documentation. This includes the environmental policy, action plan, environmental targets, organisation, training and various procedures to fulfil the environmental management requirements.

Requirement O16 concerns environmental targets. It is only natural for Nordic Ecolabelling, as an ecolabelling body, to set requirements that oblige licensees to continue to develop their environmental efforts. The targets that the store establishes must be realistic. A store may, for example, set the target of maintaining their levels of unsorted waste, if they currently produce very little unsorted waste or if they anticipate a significant increase in sales.

5.8 Total score

The criteria are flexible, which means that it is not necessary for a store to excel in all areas. Stores must achieve a score of 33 out of a possible 49 points. Since many of the point score requirements have been changed, the required total score will be reviewed during and following the referral period. Once Nordic Ecolabelling has gained more information about fulfilment of this score requirement, the limit for 67% may be adjusted.

6 Changes since previous version

- Requirements on product range differentiated by country due to varying availability of organic and ecolabelled products.
- Higher proportion of stocked organic and ecolabelled products required.
- Points awarded to stores not selling seafood with red light according to WWF guidelines.
- The waste requirement has been tightened in part. Stores are now awarded points for reducing quantities of unsorted waste.
- Points awarded if organic waste is deposited for rotting or composting.
- Points awarded if the supplier's fleet runs on Nordic Ecolabelled fuel or biofuel.
- Points awarded for suppliers' vehicles fulfilling Euro 5 standards.
- Set limit to the permitted energy consumption. Required that the store compares its energy consumption and TEWI with target values.
- Point score requirement regarding PVC/PVDC.
- Points awarded if Nordic Ecolabelled printing company is used.
- Required to document sales direction.

7 Future criteria

- Requirements regarding organic and ecolabelled products will be raised.
- Requirement on energy consumption and TEWI will be tightened.
- More stringent waste requirements.
- Investigation of the possibility to set absolute requirements for TEWI/carbon dioxide emissions.
- Requirement on the proportion of organic and ecolabelled sales of the store's total sales.

8 References

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Appendix 1

CALCULATION TOOL FOR ASSESSING THE ENERGY CONSUMPTION AND TEWI OF GROCERY STORES

On assignment from Nordic Ecolabelling, the consulting firm Partor AB has developed a calculation tool to assess the energy consumption and climate impact (TEWI - total equivalent warming impact) of different grocery stores. There follows a description of the calculations that the tool uses.

Purpose

The purpose of this tool is to evaluate stores based on their actual energy consumption independent of the equipment and technology that is used. By assessing the end results, rather than how these are achieved, allows the store greater freedom while still requiring that equipment functions efficiently.

General

The tool is based on key ratios that have been established through simulations and observations. It is designed to provide a fair assessment taking into regard various parameters that can vary between stores.

Calculations

Described in the following section are the calculations that form the basis of the calculated target figures.

Electricity consumption

Food refrigeration – appliances

“Food refrigeration – appliances” refers to compressors for refrigerators and freezers, coolant pumps, refrigerant pumps and dry coolers. The following conditions are used for the calculations:

- Evaporation temperature, refrigerator: -7°C at -20°C outdoor air/ -13°C at +27°C outdoor air, linear temperature profile.
- Evaporation temperature, freezer: -30°C.
- Evaporation temperatures at dewpoint.
- Cooling load, refrigerator: 100% at +27°C outdoor air/ 50% at -20°C outdoor air, linear load profile.
- Cooling load, freezer: 100% at +27°C outdoor air/ 80% at -20°C outdoor air, linear load profile.
- Speed control on compressor units and dry cooler fans.
- Pumps of 50% total efficiency.

- Refrigerator refrigerant: R407C.
- Freezer refrigerant: R404A.
- No low-temperature heat recovery.
- Cold units covered at night.
- Refrigerant discharge temperature limit: 5°C.

The cooling load is calculated based on information about walk-in refrigerators, length of cold display units and manufactures' data. Well display freezers are assumed to have lids. Plug-in units are counted as equivalent to remote units connected to an external condensing unit.

Food refrigeration – display units and rooms

“Food refrigeration – display units and rooms” refers to the electricity consumption of fans, lighting, frame heating and defrosting for display units and of fans, defrosting and frame heating for walk-in freezers. The reference values for display units are based on the manufacturers' technical specifications. The display units have energy efficient EC fans and controlled frame heating (average heating output: 30%). Freezer units have electrical defrosting every three days (1 hour per defrost) and refrigeration units have passive defrosting.

Walk-in freezers are cooled with fan evaporators and walk-in refrigerators with gravity coils. Walk-in freezers have electrical defrosting four hours a week and walk-in refrigerators passive defrosting.

Interior lighting

Interior lighting is assumed to consume 15 W/m² during opening hours + 1 hour/day. Further it is assumed that the lighting is turned off at all other times. 15 W/m² is a relatively common lighting power in grocery stores.

Car park lighting

Car park lighting is approximated as 26 W/parking space and to be illuminated 12 hours/day (approx. 114 kWh/year/parking space). Standard, functional car park lighting is taken as representative.

Bakery

A bakery is assumed to consume 100 000 kWh/year per m² of oven doors.
(Clarification: A bakery includes making dough and baking.)

Bake-off bakery

A bake-off bakery is assumed to consume 67 000 kWh/year per m² of oven doors.
(Clarification: A bake-off bakery only performs baking.) It is assumed that a bake-off bakery uses less energy than a bakery since a full bakery is a large investment and accordingly utilised to a greater degree.

Chicken oven

A chicken oven is assumed to consumer 75 000 kWh/year per m² of oven doors.

Restaurant

A restaurant is assumed to use 4 kWh/served portion of heated food. Cafés are not included.

Ventilation fans

The energy consumption of ventilation fans is based on the size of the store, opening hours, cooling requirement and whether the store has its own roof. See also *Store heating*.

If the store specifies that electricity for ventilation is not included in the electricity consumption, an estimated consumption (twice the target value) is added to the actual consumption in the TEWI calculation. This standard value is based on experience but is also higher than the target value to encourage the store to keep better track of its consumption.

Air conditioning

The air conditioning requirement is based on store size, opening hours, cooling and average annual temperature. The coefficient of performance of the air conditioning unit is assumed to be 2.5 (based on the manufacturer's dimensioning tool for sensible cooling output. Estimated 20% latent output and some auxiliary power). See also *Store heating*.

Other electricity use

Other electricity consumption, such as computers and staff kitchen, is assumed to be 3 W/m² during opening hours and 1 W/m² at other times.

Heat consumption

If the store specifies that heating is not included in the energy consumption, an estimated consumption (1.5 times the target value) is added to the actual consumption in the TEWI calculation. This standard value is higher than the target value to encourage the store to keep better track of its consumption and reduce the risk of purposeful nondisclosure of heat consumption. If the heating system is reasonable, this does not influence the end result particularly.

Store heating

The store's heat demand is taken from ventilation and transmission calculations based on the size of the store, opening hours, cooling requirement, annual average temperature and whether the store has its own roof. In addition, the following parameters are used:

- Demand-controlled heat and cooling recovery (70% efficient).
- Recirculated air.
- Exhaust air controlled temperature and differential pressure controlled fans.
- Fresh air flow is 0.5 l/m²s during opening hours and is 0.35 l/m²s at all other times.

- Ventilation system is dimensioned for flow of 2 l/m²s and set for variable flow and a basic flow of 60% (max. supply air temperature of 33°C).
- Rating of supply and exhaust air fans of 1.25 kW/m³s.
- U-value of 0.28 W/m²K based on 130 mm insulation and 10% additional insulation from other building material.
- Cooling is assumed to drop by 40% outside of operating hours (opening hours + one hour/day) due to cold display units being covered at night.
- The surface area of walls is based on the store being square. If the store has its own roof it is considered to be a stand-alone building. This means that all walls are considered exterior walls and that the ceiling height is six metres. If the store does not have its own roof, only two walls are considered exterior walls and the ceiling height is assumed to be three metres.

Hot water

The heat consumption for hot water is estimated as 1 kWh/m²/month.

Ground heating

Ground heating is calculated based on freestanding buildings (stores with own roof) having 100 m² heated ground (e.g. entrance and loading platform) and other stores 50 m² (entrance). The heating requirement for ground heating is approx. 200 kWh/m²/year.

Transferred heat

If the store transfers heat for use in other parts of the premises, this heat can, for example, compensate for the store running low-temperature heat recovery. This is since the premises can reduce the quantity of purchased energy for heating. The emissions value shall be the same for the “sold” heat as for the energy source that it replaces. If the premises are heated using district heating and “buy” 100,000 kWh of heat from the store, the store’s TEWI is lowered by the equivalent to 100,000 kWh with an emission value for district heating. The maximum emission value that the store may use is that of a heat pump with a coefficient of performance of five (emission value of electricity divided by five). The declared amount of heat must be measured and used in premises other than the store.

Agreements between the store and the heat recipient regarding payment are of no consequence here.

District cooling

District cooling is evaluated in the same way as other forms of energy consumption. If the emission value is not specified, a standard value for the coefficient of performance of five is used. This is the approximate performance coefficient for Swedish district cooling production including free cooling and auxiliary power.

Water consumption

Water consumption does not affect the store's TEWI in the calculation tool. Water consumption is however included to raise awareness and enable its follow-up. Water consumption may be included in future evaluation criteria. The target value is 0.5 m³/m²/year.

The target value is based on the actual consumption of a large store with busy bakery, restaurant and flower shop. The consumption of the majority of stores should therefore lie somewhat under this level.

Calculation of environmental impact of purchased heat

The values shall be calculated from a lifecycle perspective. The values shall show the climate impact and primary energy consumption. The calculations shall adopt a system perspective and use annual averages. Historic values shall also be provided for the carbon dioxide equivalent and primary energy factor. Historic values refers to the environmental evaluation of energy that has already been consumed. This is relevant for accounting/settlement/environmental accounting.

The calculations shall not consider the origin of the energy (green energy/electricity, guarantee of origin, etc.).

Emissions shall be specified as CO₂ equivalents for the lifecycle value of the used fuels. These shall be based on the Swedish National Environmental Protection Agency's carbon dioxide factors.

The primary energy factors are calculated using used energy according to standard SS-EN 15316-4-5 with in-data primarily taken from Energieffektiviseringsutredningen (governmental investigation into energy efficiency), SOU 2008:110, with a few exceptions that are clearly specified.

Standard markups according to the attached table are added for the production and transport of fuel (lifecycle perspective). This information is taken from "Miljöbedömning" (2005), an environmental assessment programme within Effektiv, www.aktiv.org.

Own heat

The thermal value and fossil carbon content of the fuel, and burner efficiency form the basis of the primary energy use and climate impact calculations. Standard values for the production and transport of the fuel shall be included.

If electricity is used, the purchased energy in kWh shall be multiplied by a factor of 2.5 for the primary energy consumption, and a factor of 350 for CO₂ equivalent in grams.

Locally produced heat

The thermal value and fossil carbon content of the fuel, and burner efficiency form the basis of the primary energy use and climate impact calculations. Standard values for the production and transport of the fuel shall be included.

If electricity is used, the purchased energy in kWh shall be multiplied by a factor of 2.5 for the primary energy consumption, and a factor of 350 for CO₂ equivalent in grams.

Calculations shall adopt a system perspective.

Purchased waste heat not produced by the store can be deducted. However, possible electricity used running pumps and similar must be added.

District heating

The thermal value and fossil carbon content of the fuel, and burner efficiency form the basis of the primary energy use and climate impact calculations. Standard values for the production and transport of the fuel shall be included.

If electricity is used, the purchased energy in kWh shall be multiplied by a factor of 2.5 for the primary energy consumption, and a factor of 350 for CO₂ equivalent in grams.

Calculations shall adopt a system perspective.

Purchased waste heat not produced by the store can be deducted. However, possible electricity used running pumps and similar must be added.

The alternative calculation methodology, in accordance with Directive 2004/8/EC on the promotion of cogeneration, shall be used for allocation between electricity and heat production.

All values specified for individual distribution networks vary from year to year due to climatic conditions. Purchased waste heat not produced by the store can be deducted. However, possible electricity used running pumps and similar must be added.

If the trade association for district heating producers present data for the distribution network using the methodology described above, these figures shall be used. If an energy company has performed a lifecycle analysis that produces more favourable results, these can be used provided that the methodology complies with that described above.

TEWI

TEWI – Total Equivalent Warming Impact – takes into consideration the emission of greenhouse gases that can be attributed to the facility over its entire service life.

Emissions are divided into three categories - **refrigerant leakage**, **refrigerant recycling** (i.e. how much refrigerant is not taken care of when equipment/installations are retired) and **energy consumption** (direct and indirect emissions from power and heat production). These factors are totalled to an annual carbon dioxide emission equivalent.

Refrigerant sources include central cooling installations and possible heat pumps. Air conditioning installations are not included due to a problem with their definition.

Refrigerant in plug-in units is not included due to measurement issues and the small quantities involved. If the store does not specify refrigerant leakage, a standard value of 20%/year is used for cooling equipment older than one year, and 7% for equipment less than one year old. If refrigerant is specified simply as "HFC", it is assumed that the refrigerant is R404A since this is the most common. Also, this provides an incentive to the store to take better control over its refrigerant use since R404A has a relatively high global warming potential (GWP). Refrigerant charging (leakage) shall be specified in kg.

The reference installation has a 0.25 kg refrigerant charge per kW refrigeration (fully remote system) and 3 kg refrigerant charge per kW for freezers (part remote system).

10% of the charge is assumed to leak at retirement and equipment to have a service life of 10 years. Annual leakage from the reference installation is 7%.

To calculate the CO₂ emissions associated with heating, it is assumed that electrically produced heating has a performance coefficient of five (a relatively low figure for a good installation connected to the grocery store). Pellets, which are CO₂ neutral, are not used as a reference value since the use of burning systems is not permitted in all places.

Primary energy

Primary energy is the energy that is used for electricity production, heat production and similar. 1 kWh of electricity produced by a power station with an efficiency of 33% means 3 kWh of primary energy consumption.

In the calculation tool, primary energy is calculated as 2.5 times the electricity consumption. A factor of 1.1 is used for primary energy used for district heating. Purchased fuel that is declared is converted with a factor of 1. District cooling is converted with the factor 0.5 since the assumed performance coefficient is five ($2.5/5 = 0.5$). Pellets are assumed to have an energy density of 4.8 MWh/tonne and oil 10 MWh/m³.

If the store states that heating energy or electricity for ventilation is not included in the specified energy consumption, the equivalent primary energy is added in the same way as for the TEWI calculation and using the same standard values.

Benchmark and financial evaluation

The calculation tool includes a benchmarking diagram that compares the store with a selection of other stores. It also provides a simple financial evaluation. The results from the financial evaluation provide savings potentials and an investment plan that shows how much the store can invest in energy efficiency measures alone (present value based on savings potential, cost of capital and service life). For simplicity, the investment plan does not take into regard factors such as fluctuations in energy prices or a change in service costs resulting from higher-quality equipment. This means that the calculated saving is somewhat conservative.

Basis for calculation

Input parameters

Calculations are based on a number of parameters that must be collected for each individual store. These parameters are:

- Floor area [m²]
- Opening hours [hours/week]
- Whether store has own roof [Yes/No]
- Average annual temperature [°C]
- Number of servings in the restaurant (if applicable) [servings/year]
- Whether the refrigeration system is older than 1 year [Yes/No]
- Area of lit car park for which electricity is billed to the store [m²]
- Bake-off or full bakery [None/Bakery/Bake-off]
- Door area of bake-off/bakery ovens [m²]
- Chicken grill [Yes/No]
- Door area of chicken grill [m²]
- Whether store heating is included in specified energy consumption [Yes/No]
- Whether electricity for ventilation is included in specified energy consumption [Yes/No]
- Electricity consumption [kWh/year] & [kg CO₂/kWh]
- District heating consumption [kWh/year] & [kg CO₂/kWh]
- Pellets consumption [tonne/year] & [kg CO₂/tonne]
- Oil consumption [m³/year] & [kg CO₂/m³]
- Natural gas consumption [kWh/year] & [kg CO₂/kWh]
- LPG, propane and/or butane consumption [kWh/year] & [kg CO₂/kWh]
- Town gas consumption [kWh/year] & [kg CO₂/kWh]
- District cooling consumption [kWh/year] & [kg CO₂/kWh]
- Transferred heat [kWh/year] & [kg CO₂/kWh]

- Water consumption [m³/år]
- Length of cold displays by type of display [m]
- ISO2 coefficient of performance for alternative display units [kW]
- Number of walk-in refrigerators and freezers, and door area [number, m²]
- Refrigerant sources in central cooling installations and possible heat pumps [type, charge in kg]
- Refrigerant leakage (charging) during the last two years [kg/year]

Explanation of input parameters

For the evaluation of the store to be fair, it is essential that the parameter values entered in the calculation tool are an accurate reflection of the store's actual situation during the period of energy measurement. If, for example, the store has installed baking ovens following the energy measurement, these ovens shall not be specified. The same argument applies to cold displays, opening hours, in-store restaurant, and so on.

The length of cold displays and size of walk-in refrigerators shall be measured to determine the cooling load. It is recommended to use the attached form to simplify data collection. Using this form, length can be measured in metres or, for example, number of tiles. It must be specified for each well unit, upright unit and walk-in unit whether the unit is a refrigerator (connected to a remote compressor or warmer than -3°C for plug-in) or a freezer (connected to a remote compressor or warmer than -18°C for plug-in)

- Display length refers to custom length units.
- Well units narrower than 1.5 metres are measured on one side only, while well units wider than 1.5 metres are measured along both sides. The longest side of well units shall be measured.
- Half-height cabinets are cabinets that are no more than 1.7 metres in height. These count as 2/3 the display length of full height cabinets. Full-height cabinets are more than 1.7 metres tall.
- The difference between upright (capped) and semi-upright (open) display units is determined by the location of the air curtain. In upright units, the air curtain is positioned at the front, while in semi-upright units it is located at the rear edge.
- Only plug-in display units that are in use are included. The number of plug-in units used by the store varies over time. However this variation in cooling capacity is generally minimal compared to the total capacity.
- Regarding walk-in refrigerators that are conjoined with rear loading displays (e.g. dairy refrigerators), the floor area occupied by the displays is not included.

- Walk-in refrigerators are defined as chilled rooms to which the store has access and that are not part of the retail area. Walk-in refrigerated retail space (for dairy products, etc.) is therefore not counted as walk-in refrigerators. This is so that the cooling load is not counted twice since a refrigerated retail space reduces the cooling need of the displays.
- Floor area includes retail space, offices, staff rooms, stock rooms (including cold storage) and technical areas (e.g. rooms for ventilation and refrigeration machinery).
- The ISO2 coefficient of performance is for cooled display units in an environment of 22°C and 65% relative humidity. The figure is provided by the display supplier.
- Since remote units and plug-in units are counted as equivalent regarding target consumption, it does not matter if these get mixed up.
- The age of equipment is determined by its oldest component. If, for example, a compressor is changed but the old freezers are still used, it is the age of the freezers that applies.
- The maximum emission value for transferred heat is equivalent to a heat pump with a performance coefficient of five. It is however possible to enter a higher figure into the tool. The tool does not use values greater than the specified maximum. The coefficient of performance is a result of the heat produced by the equipment for cold food storage and display.
- Electricity consumption only refers to purchased electricity from the national distribution network. Possible electricity produced by the store is not counted here. The energy used by a diesel generator for electricity production, for example, is then evident under oil consumption.
- If the store does not have an emission value for its district cooling supplier, a standard value equivalent to cooling equipment with a performance coefficient of five is used.

Miscellaneous

The store's turnover is a parameter that is requested for two reasons: firstly, the greater the turnover, the greater the disturbance to the air flow in the display units; and secondly, so that the store uses its display units in an optimum way and does not install extra units simply to gain a higher target value for energy consumption. Partor AB has however chosen not to take turnover into consideration since:

1. The influence on the air currents in the display units is very small. In addition, the cooling load of units is based on factors such as cross wind.
2. Only the length of cooled display units may be included in the cooling requirement. Therefore, the net result of installing many unnecessary units is zero. Further, retail space is considered far too expensive for a store to waste it on unnecessary cold display units.

Requests have been made to assess energy produced by the store itself in the same way as purchased energy so that stores are classed by energy efficiency irrespective of energy source. The idea is, for example, to avoid solar panels compensating for poor cold storage equipment. Partor AB believes that energy produced by the store itself should not be included at all.

If a diesel generator or similar is used for in-store energy production the energy type is included under the requirements on energy consumption (oil, pellets, gas, etc.). If solar, wind or similar renewable energy source is used, this is not included either. A store that installs such systems is allowed to have a higher energy consumption since it nonetheless reduces the need for purchased energy. The arguments for this are as follows:

1. This reasoning is consistent. If all produced energy is to be included, then even heat taken from geothermal sources and that produced by cooling equipment should be included.
2. The total environmental impact of the store is what is of interest. By allocating the store a reasonable CO₂ capital, the store itself may decide how to use this in the best way.
3. If CO₂-neutral electricity from solar panels or a wind generator is included in the energy consumption, Nordic Ecolabelling does not provide an incentive to invest in such systems.