Expertise hub for a market uptake of energy-efficient supermarkets by awareness raising, knowledge transfer and pre-preparation of an EU Ecolabel
• EU Ecolabel
• Existing ecolabels for food retail stores
• Criteria development
• Type I Ecolabel according to DIN EN ISO 14024
  • Voluntary program
  • Takes the entire life cycle perspective into account
  • There is a third-party verification for achieving it
• Exists for a wide range of product groups, for instance heat pumps
• Has a set of criteria for each group
  • developed by many expert groups, including businesses
• Acknowledged in all of Europe
Objectives

- sustain the environment for both todays and coming generations
- inform customers about green solutions
- Contribute to the goals of 7th Environment Action Programme [1]
  - to protect, conserve and enhance the Union’s natural capital
  - to turn the Union into a resource-efficient, green, and competitive low-carbon economy
  - to safeguard the Union’s citizens from environment-related pressures and risks to health and wellbeing
  - to make the Union’s cities more sustainable
  - to help the Union address international environmental and climate challenges more effectively.

## MANAGEMENT OF THE EU ECOLABEL

<table>
<thead>
<tr>
<th>Who</th>
<th>Function</th>
<th>Worth mentioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>The European Union Ecolabelling Board (EUEB)</td>
<td>Advisor and recommender for making and updating the criteria</td>
<td>Composed of many interest groups</td>
</tr>
<tr>
<td>The European Commission</td>
<td>Finally responsible for the criteria and that these are followed</td>
<td>• Can delegate tasks</td>
</tr>
<tr>
<td>&quot;Competent Bodies&quot; (independent, neutral organizations)</td>
<td>Administer the label locally (on behalf of the European Commission)</td>
<td>• Offers funding</td>
</tr>
<tr>
<td>Stakeholders (representatives from the relevant fields)</td>
<td>Involved in developing criteria</td>
<td>Take part in the EUEB</td>
</tr>
<tr>
<td>The EU Ecolabel Helpdesk</td>
<td>• Answers questions</td>
<td>Second instance to contact if help, advice or clarification is required (the first is the local Competent Body)</td>
</tr>
</tbody>
</table>
Any interested party can start the process

Almost any product group

Requires on average two years

Close cooperation with the Commission
REQUIREMENTS TO PROPOSER LEADING THE DEVELOPMENT PROCESS

- Demonstrate high knowledge about the product group
- Ensure that several affected groups are involved in the consortium
- Provide sufficient leadership
- Provide:
  - Feasibility and improvement analysis
  - Environmental and market studies
  - Revision of existing life cycle analyses, or a new analysis
SETTING THE CRITERIA

- Based on analysis results
- 10 to 20% of the currently most environmentally friendly products should meet them
- EUEB should take part in the discussion

WHAT THE SUPERSMART PROJECT IS DOING

• Currently, food retail stores are not included in the EU Ecolabelling scheme

• The SuperSmart project will propose criteria for such a product group
  • Existing ecolabels will be an important base for this

• Why?
  • Large potential for reducing environmental impact
  • Food retail stores have high energy demand (>1 million supermarkets in Europe, use about 4% of the electricity in Europe [2])

MEANS TO REDUCE THE ENVIRONMENTAL IMPACTS:

- Reducing the use of energy and other resources
- Reducing barriers for implementing new, energy efficient and eco-friendly solutions through the use of an acknowledged label
- Ensuring trained personnel in the stores
- Economic savings for the stores to enhance implementation
- Ensuring safe, comfortable conditions in the stores
- Increasing shelf life and thereby decrease waste
- Reducing pollution from all sources, including refrigerant leaks
POSSIBLE CRITERIA

- The criteria will be based on existing national ecolabels and the outcomes of the life cycle analysis

- Energy efficiency of the:
  - Building envelope
  - Refrigeration system
  - Heating system (heat recovery etc.)
  - Air conditioning system
  - Lighting
  - Electrical equipment (cashier, weights, ovens etc.)

- Environmental impact of the refrigerants

- Life cycle construction products

- Water consumption
EXISTING ECOLABELS FOR FOOD RETAIL STORES

- Many types of ecolabels, different scope and management
- Three existing Type I ecolabels for food retail stores in Europe
  - The Blue Angel
  - The Nordic Swan Ecolabel
  - Good Environmental Choice

Bra Miljöval
THE BLUE ANGEL (DER BLAUE ENGEL)

- German ecolabel
- ≈120 different product groups
- Promote environmentally friendly products
- Help customers to make green choices
- Firms outside Germany can apply for the Blue Angel
<table>
<thead>
<tr>
<th>Function</th>
<th>Name</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Label owner</td>
<td>German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety</td>
<td></td>
</tr>
<tr>
<td>Criteria developer</td>
<td>German Environment Agency</td>
<td></td>
</tr>
<tr>
<td>Decision making body</td>
<td>Environmental Label Jury</td>
<td>Decides which product groups and criteria are adopted Representatives from many fields, parts of value chain</td>
</tr>
<tr>
<td>Independent, third-party</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awarding body</td>
<td>RAL gGmbH</td>
<td>Verifies the applications by companies</td>
</tr>
<tr>
<td>Independent</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DEFINITION AND SCOPE

- Definition of Grocery stores in the food retail sector:
  - Product range consists primarily of food
  - At least 50% of the turnover through the sale of food
  - The presented criteria are valid for grocery stores in the food retail sector
Climate-Friendly Grocery Stores in the Food Retail Sector

- Fill out an application
- Give information on the products and expected sales
- Document compliance with
  - twelve mandatory and
  - some of twelve optional requirements
- Experts help on writing the application (German or English)
- More information and criteria: [www.blauer-engel.de/en](http://www.blauer-engel.de/en)

The number of optional requirements to be met

<table>
<thead>
<tr>
<th>The building is:</th>
<th>Rented</th>
<th>Owned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>New</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>
## MANDATORY REQUIREMENTS

<table>
<thead>
<tr>
<th>Field</th>
<th>Requirement</th>
</tr>
</thead>
</table>
| Energy requirement of the building   | Existing buildings: ≥ 0%  
New buildings: > 30%  
Primary energy reduction compared to reference building according to EnEV 2009[^1] |
| Energy management system             | Operation according to DIN EN ISO 50001                                      |
| Electricity procurement              | Certified green electricity with proven additionality                        |
| Energy efficiency of the refrigeration system | Old² system: ≥15%  
New system: ≥35%  
Reduction in key energy efficiency indicator compared to existing refrigeration systems |
| Heat recovery                        | Heat recovery with capacity of ≥75% of heating load installed                |
| Refrigeration cabinet covers         | Low temperature cabinets: permanent cover  
Medium temperature cabinets: night cover |
| Refrigerants                         | ≤ 5% fluorinated refrigerants in plug-in refrigeration equipment and cabinets  
Only natural refrigerants in the central refrigeration system |
| Foaming agents                       | No halogenated organic compounds/agents in any system containing refrigerant |
| Artificial indoor lighting           | ≥ 90% switched off outside operating hours                                    |
| Location and accessibility           | ≤ 15 W/m² maximum power consumption                                          |
| Sales area ≤ 1000 m²: ≥ 10 bicycle stands within 20 m distance  
Sales area > 1000 m²: ≥ 20 bicycle stands within 20 m distance |
| Printed advertising material         | Advertising brochures on Blue Angel certified recycled paper                  |
| Sustainable building                 | Building or renovation of own building(s) based on either Guideline for Sustainable Building[^3] or the DGNB[^4] criteria |

[^1]: EnEV 2009—Energieeinsparverordnung (English: Energy Saving Ordinance) is a German Ordinance describing minimum requirements for the energy use of new and renovated buildings in terms of insulation and energy efficient equipment. The requirements are based on a defined reference building.

[^2]: 2009 is the baseline.


## EXAMPLES OF MANDATORY REQUIREMENTS

<table>
<thead>
<tr>
<th>Field</th>
<th>Requirement</th>
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</table>
| **Energy requirement of the building** | **Existing buildings: > 0%**  Primary energy reduction compared to reference building according to EnEV 2009¹  
**New buildings: > 30%**          |
| **Energy efficiency of the refrigeration system** | **Old² system: ≥15%**  Reduction in key energy efficiency indicator compared to existing refrigeration systems  
**New system: ≥35%**              |
| **Heat recovery**                 | **Heat recovery with capacity of ≥75% of heating load installed**                                                                           |
| **Refrigeration cabinet covers**  | **Low temperature cabinets:** permanent cover  
**Medium temperature cabinets:** night cover   |
| **Refrigerants**                  | **≤ 5% fluorinated refrigerants in plug-in refrigeration equipment and cabinets**                                                             |
| **Artificial indoor lighting**    | **≥ 90% switched off outside operating hours**  
**≤ 15 W/m² maximum power consumption**                                                      |
| **Location and accessibility**    | **Sales area ≤ 1000 m²:** ≥ 10 bicycle stands within 20 m distance**  
**Sales area > 1000 m²:** ≥ 20 bicycle stands within 20 m distance**                      |

¹ EnEV 2009 – Energieeinsparverordnung (English: Energy Saving Ordinance) is a German Ordinance describing minimum requirements for the energy use of new and renovated buildings in terms of insulation and energy efficient equipment. The requirements are based on a defined reference building.

² 2009 is the baseline.
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<tr>
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<td>Existing buildings: &gt; 0%</td>
<td>Primary energy reduction compared to reference building according to EnEV 2009¹</td>
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<tr>
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<td></td>
</tr>
<tr>
<td></td>
<td>Sales area &gt; 1000 m²: ≥ 20 bicycle stands within 20 m distance</td>
<td></td>
</tr>
<tr>
<td>Printed advertising material</td>
<td>Advertising brochures on Blue Angel certified recycled paper</td>
<td></td>
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<td>Building or renovation of own building(s) based on either Guideline for Sustainable Building³ or the DGNB⁴ criteria</td>
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<td></td>
<td>New buildings: &gt; 50%</td>
</tr>
<tr>
<td>Energy management system</td>
<td>Operation of according to EMAS¹</td>
</tr>
<tr>
<td>Energy efficiency of the refrigeration system</td>
<td>Old system: &gt; 25% Reduction in key energy efficiency indicator compared to existing refrigeration systems</td>
</tr>
<tr>
<td></td>
<td>New system: &gt; 45%</td>
</tr>
<tr>
<td>Refrigeration cabinet covers</td>
<td>Medium temperature cabinets: permanent cover</td>
</tr>
<tr>
<td>Refrigerants</td>
<td>Only natural refrigerants</td>
</tr>
<tr>
<td>Foaming agents</td>
<td>No halogenated organic compounds/agents allowed in the building</td>
</tr>
<tr>
<td>Artificial indoor lighting</td>
<td>≤ 12 W/m² maximum power consumption</td>
</tr>
<tr>
<td>Daylight</td>
<td>≥ 20% of total light, light-sensors installed</td>
</tr>
<tr>
<td>Lighting concept</td>
<td>Detailed plan for optimal lighting: lamp types and number, power need, luminous flux and illumination (illuminance level)</td>
</tr>
<tr>
<td>Photovoltaic systems</td>
<td>Covering ≥ 40% of the roof</td>
</tr>
<tr>
<td>Location and accessibility</td>
<td>≤ 1 km from nearest public transport stop</td>
</tr>
<tr>
<td>Sustainable building</td>
<td>Building or renovation of rented building(s) based on either Guidelines for Sustainable Building or the DGNB criteria</td>
</tr>
</tbody>
</table>

¹ Eco-Management and Audit Scheme (EMAS) at [http://ec.europa.eu/environment/emas/](http://ec.europa.eu/environment/emas/)
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<td></td>
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<td>Energy management system</td>
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</tr>
<tr>
<td>Energy efficiency of the refrigeration system</td>
<td>Old(^2) system: &gt; 25%  Reduction in key energy efficiency indicator compared to existing refrigeration systems</td>
</tr>
<tr>
<td></td>
<td>New system: &gt; 45%</td>
</tr>
<tr>
<td>Refrigeration cabinet covers</td>
<td>Medium temperature cabinets: permanent cover</td>
</tr>
<tr>
<td>Refrigerants</td>
<td>Only natural refrigerants</td>
</tr>
<tr>
<td>Foaming agents</td>
<td>No halogenated organic compounds/agents allowed in the building</td>
</tr>
<tr>
<td>Artificial indoor lighting</td>
<td>≤ 12 W/m(^2) maximum power consumption</td>
</tr>
<tr>
<td>Daylight</td>
<td>≥ 20% of total light, <strong>light-sensors installed</strong></td>
</tr>
<tr>
<td>Lighting concept</td>
<td>Detailed plan for <strong>optimal lighting</strong>: lamp types and number, power need, luminous flux and illumination (illuminance level)</td>
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<td>Photovoltaic systems</td>
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<td>≤ 1 km from nearest public transport stop</td>
</tr>
<tr>
<td>Sustainable building</td>
<td>Building or renovation of rented building(s) based on either Guidelines for Sustainable Building or the DGNB criteria</td>
</tr>
</tbody>
</table>

A bit stricter than mandatory.

THE NORDIC SWAN ECOLABEL

- Also known as the White Swan/the Nordic Swan
- For the Nordic countries
- Products that are more environmentally friendly than their alternatives
- Encourage consumers to choose environmentally friendly products
- The criteria are updated regularly

THE NORDIC SWAN ECOLABEL

- Initiative from the Nordic Council of Ministers
- Administrated by own groups in each country, on behalf of each governments
- Awarded to products by experts in the different fields
- Founded by the public
- No commercial interests involved
Nordic Ecolabelling for Grocery stores

- Stores that have a broad range of products in several product groups, and where groceries account for more than 50% of sales, can apply for the Nordic Swan Ecolabel. The grocery store may be a single store, part of a larger chain or an online store.

- A Nordic Swan Ecolabelled store:
  - has a good selection of ecolabelled and organic products in its assortment,
  - is operated energy-efficiently to minimize the effect on the climate,
  - has a focus on sorting of waste and on minimizing food waste to spare the resources of the planet.

- 233 supermarkets hold the label
To receive the label it is required to:

- Fulfil mandatory requirements and receive at least 23 out of 63 points
- Fill out application form
- Pay a small fee to finance the labelling
- Document that the criteria are fulfilled (use annexes for help)
- Information, annexes, requirements and application form: www.nordic-ecolabel.org
- Independent bodies test and inspect criteria compliance
## OVERVIEW OF REQUIREMENTS

<table>
<thead>
<tr>
<th>Category</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 General</td>
<td>Groceries as a proportion of total sales (O1)</td>
</tr>
<tr>
<td></td>
<td>Breadth of product range (O2)</td>
</tr>
<tr>
<td>2 Maintenance of the Nordic Swan Ecolabel licence</td>
<td>Maintaining the licence (O3)</td>
</tr>
<tr>
<td></td>
<td>Responsible persons (O4)</td>
</tr>
<tr>
<td>3 Product range</td>
<td>Sale of organic food and drink, and products from sustainable fishing (O5)</td>
</tr>
<tr>
<td></td>
<td>Higher sales of organic food and drink, and products from sustainable fishing (P1, max. 10 p)</td>
</tr>
<tr>
<td></td>
<td>Sale of ecolabelled consumables (O6)</td>
</tr>
<tr>
<td></td>
<td>Higher sales of ecolabelled consumables (P2, max. 10 p)</td>
</tr>
<tr>
<td></td>
<td>Sale of ecolabelled durables (O7)</td>
</tr>
<tr>
<td>4 Energy</td>
<td>Energy efficiency (O8)</td>
</tr>
<tr>
<td></td>
<td>Good energy efficiency (P3, max. 20 p)</td>
</tr>
<tr>
<td>5 Waste</td>
<td>General waste (O9)</td>
</tr>
<tr>
<td></td>
<td>Little general waste (P4, max. 8 p)</td>
</tr>
<tr>
<td></td>
<td>Waste sorting (P5, max. 2 p)</td>
</tr>
<tr>
<td></td>
<td>Measuring visible food waste (O10),</td>
</tr>
<tr>
<td></td>
<td>Measures to reduce food waste (P6, max. 10 p)</td>
</tr>
<tr>
<td>6 The store’s use of goods and services</td>
<td>Ecolabelled consumables and services (O11)</td>
</tr>
<tr>
<td></td>
<td>Higher purchase of ecolabelled consumables and services (P7, max. 3 p)</td>
</tr>
<tr>
<td>7 Overall</td>
<td>The store’s points total (O12)</td>
</tr>
</tbody>
</table>

GOOD ENVIRONMENTAL CHOICE (BRA MILJÖVAL)

- Label of the Swedish Society for Nature Conservation (SSNC)
- Achievable in Scandinavia
- 11 product areas are included
  - Only products that are quite usual and have a significant environmental impact: Preventing that High effort → low effect
TO CREATE A LABEL FOR A NEW PRODUCT GROUP

• Experts propose criteria, using life cycle analysis (LCA)

• End-users/industry and authorities are involved

• Final criteria should be strict but achievable

• To widespread ecolabelling, initial criteria are not too strict

• When the label is established and a many products meet the requirements, these can be tightened

• The requirements are updated along with the LCAs

LABEL QUALITY ASSURANCE

• Important to avoid abuse of the label

• Random testing of those who hold the label

• Control when they suspect criteria are not met

• Rules for how to use the label in advertisements: some firms are tempted to use an ecolabelled product in advertising to give the impression that the entire firm is ecolabelled

• Basic (mandatory) requirements → good basic level of environmental effort

• Yearly requirements → devote special attention to new challenges every year
The Good Environmental Choice label for grocery shops is one of the tools used by the Swedish Society for Nature Conservation for promoting progress toward a sustainable society.

All grocery shops can be awarded according to the criteria for The Good Environmental Choice.
Basic requirements:

- The shop has a large range of organic groceries
- The shop has a large range of ecolabelled chemical products
- The shop has chosen not to sell products such as king prawns that are harmful from an environmental standpoint
- The shop carries out authentic environmental work of its own

The yearly requirements are a list of measures that the shop should be able to accomplish to improve its environmental work within the area.

Some products that might be sold in food retail stores belong to a product group covered by the EU Ecolabel, such as Personal care products, Clothing, Electronic equipment and paper products.

Use of such products is very beneficial for the environment and secures a high environmental standard without further documentation.

A possible requirement could be that a certain share of the products sold must be ecolabelled.
STANDARDS AND LEGISLATION TO BE CONSIDERED WHEN SETTING CRITERIA

- Several legal acts are relevant for an EU Ecolabel for food retail stores
- Regulations have binding legal force throughout every Member State
- Directives need to be transposed into national laws in the Member States
• Ecodesign Directive (Directive 2009/125/EC)
  • Reduce the environmental impact of energy-intensive products
  • A framework directive → no direct ecological minimum requirements are defined, but they are adopted through specific measures for products.
• Energy Labelling Directive (Directive 2010/30/EU)
  • Supplements the Ecodesign Directive with some mandatory requirements
  • Contains a delegated regulation on energy labelling for some products regulated under the Ecodesign Directive, e.g. “professional refrigerated storage cabinets” (Delegated Regulation (EU) 2015/1094)
  • Defines the energy efficiency classes (G up to A+++), and the requirements to achieve them.
• F-gas Regulation*
  • Aims to reduce the emissions from fluorinated greenhouse gases
  • Three main regulatory approaches:
    • Gradual phase down of available Hydrofluorocarbons (HFCs) on the markets to 21 % of current levels by 2030,
    • Prohibitions on use and placement,
    • Expansion of the scope of regulations regarding leak tests, certification, disposal, and labelling.
  • Refrigerants with GWP higher than 2500 must not be used for service or maintain equipment with charge size higher than 40 tonnes of CO₂ equivalent.

STANDARDS AND LEGISLATION TO BE CONSIDERED WHEN SETTING CRITERIA

- Examples of standards relevant for supermarket equipment
  - ISO 23953 for refrigerated display cabinets
    - Deals with classification, requirements and test conditions
  - ISO 5149 or EN 378
    - Specify safety requirements for refrigeration systems and heat pumps
  - Directive 2010/31/EU
    - Aims at reducing the energy consumption of buildings

STANDARDS AND LEGISLATION TO BE CONSIDERED WHEN SETTING CRITERIA

- Standards are a way to document that regulations are met.

<table>
<thead>
<tr>
<th>Limits for quick frozen foodstuffs (Evans and Foster 2015)</th>
<th>Maximum temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generally</td>
<td>-18°C</td>
</tr>
<tr>
<td>During transport/in retail cabinets</td>
<td>-15°C</td>
</tr>
<tr>
<td>In retail cabinets (if the EU member state allows it)</td>
<td>-12°C</td>
</tr>
</tbody>
</table>

- Frequent checks and equipment for revealing leakage

From July 2016, labelling for new professional storage cabinets and condensing units is mandatory.  

Forbidden to sell unlabelled/too inefficient cabinets in the EU.

- New developed test standard for this, EN 16825: Refrigerated storage cabinets and counters for professional use - Classification, requirements and test conditions (European Parliament 2015a; European Parliament 2015b).

A new regulation for commercial refrigeration units is also being processed (European Commission 2016d).

- Not published yet, consultation forum in 2014

- Will propose minimum energy performance standards

These minimum requirements for energy performance might be used in development of the EU Ecolabel.

EXAMPLE: TEGUT… IN MARBURG-CAPPEL, GERMANY

- **30% less energy** than similar, older, comparable markets (tegut... 2015; Günther 2016)
- 55% less energy than the reference building (EnEV)
- only **natural refrigerants**: CO₂ in central system, propane and isobutane in plug-ins
- 45% more efficient energy efficient refrigeration system and cabinets*
- **LED lights**: maximum power of 8.57 W/m²
- DIN EN ISO 50001 **energy management system**, optimizing operation
- **glass doors** on all cabinets
- **photovoltaic modules** cover 76% of the roof
- only clean certificated electricity
- only waste heat for space heating (**heat integration**) 
- commercials only printed on Blue Angel labelled recycled paper
- bike parking places, and accessible with public transport
- Free, clean electricity charging for cars

*than comparable existing systems

Picture from Günther 2016
• Both mandatory and optional requirements

• Identify areas of potential improvements for future updating of requirements

• Make the requirements climate dependent.

• Regulations/standards could be used as a reference for improvement

• Allow deviations from requirements if the government in the country has some special regulations that must be accounted for.

• Set the requirements high, but achievable.

• Include supermarket owners in making and updating of requirements
GOLDEN RULES FOR DEVELOPING AN EU ECOLABEL FOR FOOD RETAIL STORES

• Require that staff is trained to make the store environmentally friendly.

• Include requirements to inform users about environmentally friendly measures.

• Require that an employee is appointed for following up locally and report.

• Recommend or require use of ecolabelled and/or organic products.

• Include requirements for garbage and recycling.

• Make sure that waste of food is strongly reduced.

• Require that stores must display clearly all labels, organic food and other environmentally friendly products, as well as food close to expiration.

• Existing labels, standards and legislations should be a basis for the criteria.
GOLDEN RULES FOR ACHIEVING A LABEL

- Apply for funding before planning and building.
- Keep all documentation.
- Use other ecolabelled products when establishing and during operation of the store.
- Display all environmentally friendly or labelled brands, organic food, and food close to expiration clearly.
- Think holistically: include building, operation (refrigeration and HVAC, lighting, paper use, cleaners...), transport (both goods and customers), and disposal of waste etc. in the planning.
REFERENCES