

T1 Creating Digital Tools and Assets

Deliverable DT 1.3.2. Green Business Model Framework

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1. Introduction

Digi2Market develops Innovative Immersive Digital Technology Tools for SMEs. Immersive technologies can be described as “a vehicle through which Storytelling based marketing solutions are developed for SMEs and Clusters” (Digi2Market 2018). The clusters developed include sectors using natural biological resources and supplying industries. At least three themed clusters of SMEs in Green related sectors will be developed. The enterprises will be assisted in digitally supported environmental good practices in resource uses and a good practice guide on Green Standards in Marketing and Sales will be developed for SMEs to adopt. (Ibid.)

Digi2Market develops a framework that can be utilised to analyse the green business developments supported by the project. Through the framework, Digi2Market partners will examine resources, including materials and related emissions and waste in all stages of the business: supply, production, sales and delivery. (Ibid.)

This framework will be tested during the project; our aim is to establish conceptual basis for a Green Business Model to be applied in small enterprises in the outlying regions. The message of green products and services is expected to be an important element of the stories to be told and utilised in marketing activities, including innovative technologies of virtual and augmented reality.

Knowledge on the business performance, products and services is essential for establishing any background for the further development of activities. Therefore, the process starts with generic environmental review of attending businesses. The guidance provided at ISO 14001 Environmental Management standard is followed. In cases requesting more in-depth knowledge on the environmental aspects and impacts of products and services, also Life Cycle Analyses theory and methods can be applied.

In addition, understanding on the business objectives and strategy is needed to develop any green business activities – such as green growth strategies basing on environmentally better and more sustainable products and processes. For the business development, we consider opportunities to utilise Business Model Canvas (Osterwalder & Pineur 2010) as a tool to develop green business model (CASE 2018), and in more broad manner sustainable business models considering the Corporate Social responsibility aspects (Obst 2015). Later on, the adopted Green Business Model Framework is further developed and tested through the Digi2Market project activities, such as marketing and business advisory.

2. Organisational approach: Environmental review

International Organisation for Standardization (ISO) provides a family of standards that guide the environmental management of companies and organisations of all kind looking to manage their environmental responsibilities. The 14000 standard family provides

more generic management frameworks (such as 14001) but also more detailed supporting standards with instructions and approaches – including specific focuses on communications, (eco)labelling, LCA, carbon footprint, among others.

The framework of ISO 14001 is applicable to organisations of any size, from companies already established and audited environmental management systems to those without any prior experience on environmental management.

The ISO 14001 standard is used here as a generic guidance and inspiration for reviewing the business practices, identifying the essential environmental aspects and environmental impacts, and managing those in effective and coordinated manner. This type of initial review can provide better understanding also on strengths and positive impacts that can be utilised in marketing. The knowledge over the environmental impacts (both positive and negative) is basis for the improvement activities and for conducting green marketing.

The Environmental Review can include following subtopics:

2.1. Business description

- Description of the business sector and business activities. Description of the organisation, roles and responsibilities of the key staff members, products and services produced, and production processes utilised.
- Description of any already existing environmental management practices (systems, standards, labels, routines).

2.2. SCOT -analyses

- SCOT (Strengths, Challenges, Opportunities, Threats) analyses over the generic and environmental management issues. Ideally, this could be presented as a table and explanatory text.

2.3. Stakeholder analyses

- Generating a stakeholder analyses over the key stakeholders:
 - Who are the key stakeholders and their relation to company? (Customers, suppliers, collaborates, authorities, competitors, NGO's, media, public etc).
 - What are the opportunities of environmental / sustainable development with those stakeholders? (For instance: savings, cooperation, markets)
 - Does the company have expectations to its stakeholders in issues related to sustainability?
 - How the cooperation with each stakeholder group is managed (Documents, contracts, audits, marketing messages etc.)?

2.4. Identifying the environmental aspects and impacts

- Identifying together with the business management the main environmental aspects and impacts related to the business and its products and services (previous, current, potential future impacts):
 - Resources (materials and energy) consumed/produced
 - Emissions and waste (to air, ground, water, waste, energy, noise, dust, odour etc.
 - Are there any potential risks / accidents that could create harmful environmental impacts of danger to health/safety? How is / should the risk be avoided?

Environmental impact is either positive or negative change resulting from the operation. It could be for instance, acidification, eutrophication of waters, and change in air quality, soil degradation, ozone layer depletion or global warming impact.

- Describing the main environmental aspects (operation) and related positive and negative impacts. Example provided below:

Aspect: Chemical storage

Impact: leakage of hazardous chemicals, or avoided impact because of chemical management plan

Aspect: Energy production

Impact: CO₂ emissions of combusting fossil fuel, OR avoided CO₂ emissions by utilising renewable solar power

Aspect: Logistics/transportations

Impacts: acidification and global warming impacts of transportations, or avoided emissions by utilising renewable fuels, joint logistics and route planning

After identifying the environmental impacts, also their importance should be considered. ISO 14001 gives businesses and organisations freedom to find most suitable methods for this.

Following exemplar criteria for assessing the significance of environmental impacts can be utilised:

Table 1. Scale for assessing the severity of the impact

1	Limited impact
2	Local impact
3	Regional impact

4	Significant national/international impact
5	Not acceptable

Table 2. Scale for assessing the likelihood of the impact

1	Very seldom
2	Seldom
3	Occasionally
4	Often
5	Very often

These criteria can be extended into additional factors, such as possibilities to affect the impact and impact on the company image. However, the criteria used in assessment should not downgrade any significant environmental impacts. If the organisation has interest to investigate environmental impacts of its products and services in more detail, life cycle approach (following the ISO 14040 / 14044 standards) can be applied (See chapter 3).



Figure 1. In craft-beer manufacturing, environmental impacts are related to use of energy, water, hop, malt, yeast, washing agents, as well as packaging and transportations. These can be controlled and minimised through environmental reviewing and monitoring (Digi2Market case company Waahto Brewery, Savonlinna, Finland).

Table 3. Defining environmental aspects, impacts and their significance. (For more detailed assessments, see e.g. ISO 14004.)

Operation	Environmental aspect	Quantity Indicator	Environmental impact	Severity	Likelihood	Total (severity* likelihood)	Comments
Logistics	oil leakage	X litres	Negative impact on ground in area of ground-water protection	5	3	15	
Renewable energy production	Reduced GHG emissions	X kWh produced. CO ₂ eqv. emissions	Positive climate impact through reduced emissions	2	5	10	
n	n	n	n	n	n	n	n

2.5. Analyses of legislation and mandatory requirements

Environmental management includes identification, access and understanding of the environmental legislation, requirements and commitments related to company. For identifying these, it is essential to be aware of the business sector and its practices. Typically, all operations that require environmental permissions or statements are also relevant environmental aspects.

- Description of the environmental legislation, requirements and commitments related to company and its operations.

2.6. Environmental programme: objectives, roles and responsibilities

Basing on the environmental review, the environmental programme defines the goals and objectives and their implementation activities and responsibilities.

- Description of any goals/objectives that company could commit to? For instance: waste reduction, emission reduction, energy efficiency, risk prevention, renewable energy use.
- Description of any activities to reach those goals/objectives? For instance: training, communications, investments in efficiency, monitoring
- Defining the roles, responsibilities and schedule for the activities.

Table 4. An example of environmental programme structure.

Environmental policy	Energy saving		
Environmental objective/goal	Minimizing the use of energy in production processes		
Indicator	Reducing the use of energy by 10% or X kWh annually		
Responsibility:	Production manager		
Activity	Operation	Schedule	Person responsible
	<ul style="list-style-type: none"> - Reducing air-leakages from compressors - LED lights 	Feb 2020 Nov 2020	n.n. n.n.
Resources:	x €'s budgeted		
Follow-up:	1/2021, team meeting		

2.7. Environmental Policy

According to ISO 14001, the management establishes implements and maintains environmental policy that defines the scope of its environmental management. According to ISO 14001 (5.2.) The policy should":

- Be appropriate for the purpose and context of the organisation including the nature, scale and environmental impacts of its activities, products and services;
- Provide a framework for setting environmental objectives
- Include a commitment to the protection of the environment, including prevention of pollution and other specific commitment(s) relevant to the context of the organization;
- NOTE other specific commitment(s) to protect the environment can include sustainable resource use, climate change mitigation and adaptation, and protection of biodiversity and ecosystems.
- Include a commitment to fulfil its compliance obligations;
- Include a commitment to continual improvement of the environmental management system to enhance environmental performance.

The environmental policy shall be maintained as documented information, and be communicated within the organization."

- For the environmental policy, it would be important to describe any environmental policy or commitments that are already in use. If not available, it is possible to discuss the opportunity and potential contents for an established environmental policy.

2.8. Implementation, communicating and marketing

- Discussion of the potential of coordinated environmental management at the company – is there interest and potential to develop toward environmental management system or adoption of green standards?
- Discussion on the key messages related to environmental performance of the company (and its products/services), to whom are they targeted, and could those be utilised in green marketing. These can be more generic about Social/Environmental Responsibility, or specific related to certain processes (Clean-Tech) or characteristics of the products/services.

3. Product-based approaches

Companies can strive toward environmentally better development by improving their organisational environmental management, but also by developing production processes, products and services. EcoDesign and design for the environment (Brezet & Van Hamel 1997) refer to the strategies on how to develop more sustainable products and services. The focus is at holistic development of the new concepts with less environmental burden.

For the product-based approaches life cycle method and tools are applicable. LCA theory and method provide opportunities to investigate the life-cycle impacts of products, services, and processes. In addition, associated products (consumables), and other consumption during the lifetime should be identified and its impact modelled.

3.1. EcoDesign Strategies

EcoDesign strategies (Brezet & Van Hamel 1997) detail approaches for improve the sustainability of products and services in a systematic manner, including product component level, product structure level, product systems level and innovating new more sustainable concepts.

Product component level:

- Selection of materials with lower environmental impacts: cleaner materials, renewable materials, lower energy content materials, recycled materials and recyclable materials
- Reduction of materials usage: reduction in weight, reduction in volume (e.g. transports)
- Optimising the production technologies: finding alternative (more sustainable) production techniques, fewer production steps, lower energy consumption and waste generation, fewer and cleaner consumables (other products needed during the use).

Product structure level:

- Optimising the distribution systems: less packaging, more efficient transportations and logistics

Product systems level:

- Reduction the impact during the use of the product: energy efficiency, use of cleaner energy sources, less consumables needed, cleaner consumables, avoiding the waste and consumables
- Optimising the initial lifetime of the product: production of reliable and durable products, improving the product maintenance and repair, modular product

structures, classic (attractive) designs, and creation of stronger product-user relations

- Optimising end-of-life systems: product reuse, remanufacturing/refurbishing, material recycling, utilisation as energy through incineration

Developing new more sustainable concepts:

- Developing new concepts: concepts that include dematerialisation (reduction of the material use), substitution (replacing harmful materials/components with less harmful), shared use of the products, integration of several functions, functional optimisation of product / components, and replacing products with services.

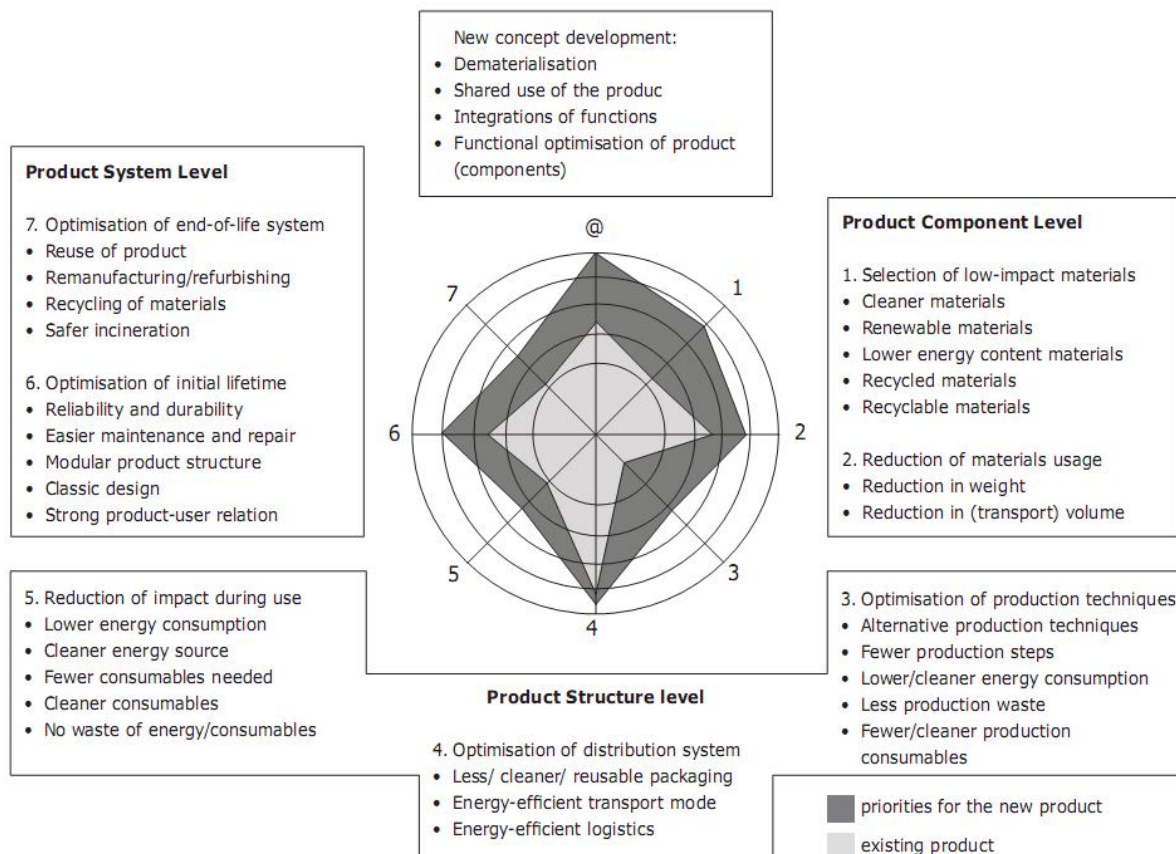


Figure 2 The EcoDesign Strategy Wheel, called also as LiDS (Life-Cycle Design Strategy) wheel (Brezet and van Hemel, 1997; Origin: The Industrial Engineering Wiki 2019, Cc-by-nc-sa-3.0).

LiDS wheel (Figure 2) (Brezet and van Hemel, 1997) is a tool analyse the use of different EcoDesign Strategies in a company. It does not provide information on the specific environmental impacts but is “a strategy tool for evaluating environmental tradeoffs between two similar or evolutionary designs.” (University of Michigan, cited in Solid

Works Sustainability 2019). This type of more comprehensive strategy approach reveals tradeoffs, or problem displacements: for instance mixing of recycled (secondary) materials with virgin (primary) materials may effect on the product recyclability, and sometimes also cause additional environmental challenges.

3.2. Life Cycle Analyses

Life cycle approach has gained increased role in green design and marketing as it enables identifying different types of environmental impacts of the products and services, and also establish metrics for the overall impacts. The analyses are guided through ISO standards 14040 (principles and framework) and 14044 (requirements and guidelines). The analyses typically have following steps (ISO 14040):

1. Defining the goal and scope: including the functional unit of analyses (e.g. product with certain dimensions and defined use), target audience and objectives of the study. This definition includes also system boundaries, i.e. what is included in or excluded from the analyses. The approach varies depending on the objectives.
2. Life Cycle Inventory (LCI), including detailed inventory of the input and outputs (e.g. materials, production processes, transportations, use of fuel and other energy, and waste and emission outputs). The resulting inventory table provides data for the further analyses of the impacts.
3. Life Cycle Impact Analyses (LCIA), utilises data from the inventory to analyse environmental impacts related to the product life cycle. Through the steps of classification, categorisation, normalisation and weighting, it is possible to establish end-point impact analyses, where different types of environmental impacts are compared and single impact end-point metric is established. Alternatively, mid-point methods can be applied without normalisation and weighting of the impacts, which results in single indicators, such as climate impact or eutrophication impact. As the LCA is an approach with several optional methods for different purposes, it is important to define the objectives and choose the methodology accordingly.
4. Interpretation of the results: in this stage the results of the analyses are utilised to make conclusions and recommendations over the results (depending on the goal and scope). This phase includes also analyses of result reliability/sensitivity.

Kontturi (2016) has established an overview of the LCA result application opportunities (Figure 3). Kontturi identifies decision-making as common for all applications and notices that understanding over the methodology is needed for all applications. When designing a new product, understanding the benefits, disadvantages and uncertainties along the life-cycle of the product is essential (Ibid.). This product-knowledge provides also opportunities to communicate environmental information in green marketing.

The utilisation of the LCA results in marketing have potential pitfalls if the marketing persons do not have experience in translating the results into usable form (Pre

Consultants 2010), or there is not enough collaboration between the product design and marketing departments (Fuller 1999 in Kontturi 2016). However, the green marketing can be an objective of the LCA, e.g. providing material for stakeholder communications, or meeting the criteria of environmental labels and certificates. The benefits of the LCA are evident as more and more detailed knowledge on the production system and impacts related to products is needed.

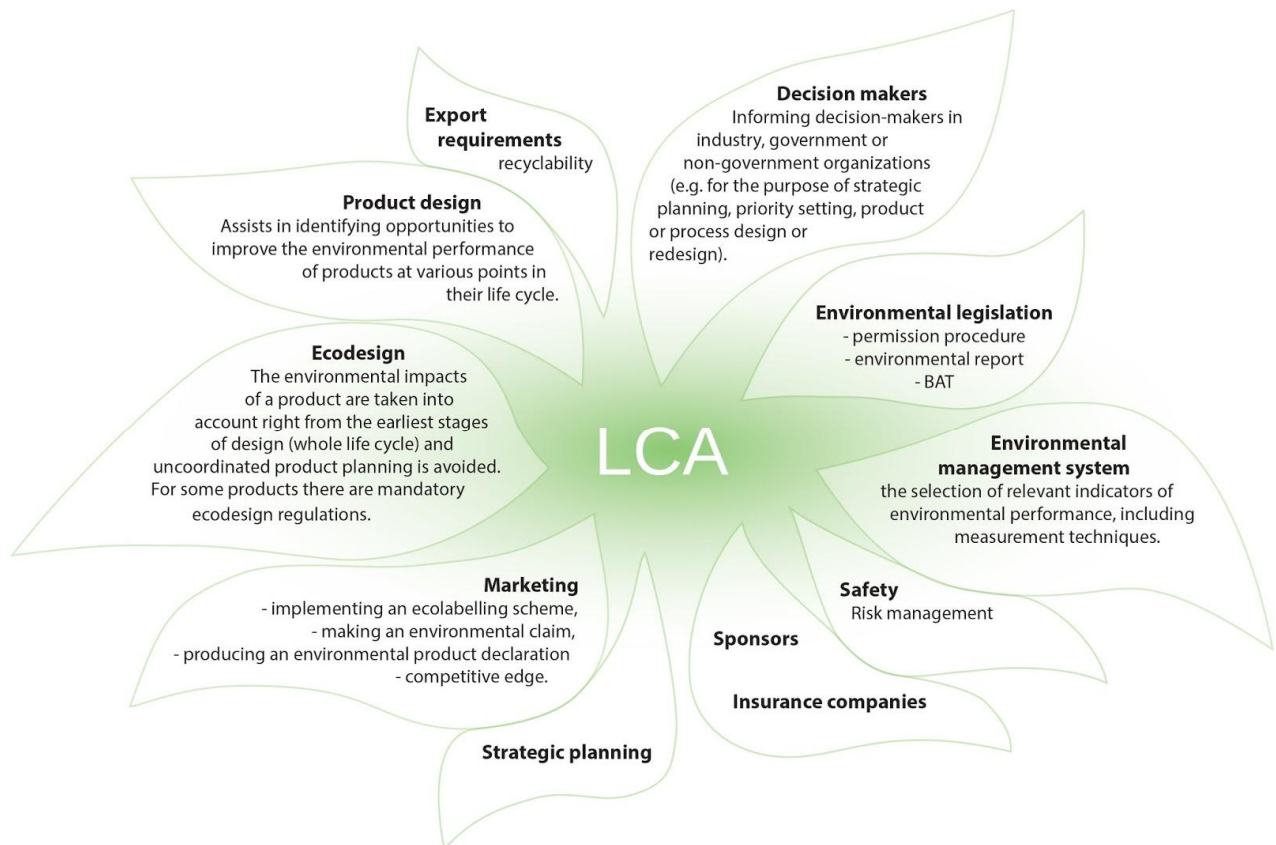


Figure 3. Application of the LCA results (Kontturi 2016, adapted from Tonteri 1998; ISO 14040).

3.3. Ecolabelling

Peattie (1995, 180) has classified green products as a product meeting customer needs, being socially acceptable and produced in a sustainable manner. The product life cycle impacts are measured, and there is knowledge on the raw materials and human resources needed. The purpose of the product, the impacts of using (and misusing, the risks involved, durability, disposal of the product and finally the locations of production are identified.

Ecolabelling goal is to communicate accurate information on the environmental aspects of products and services for consumers, raise environmental awareness, and to stimulate market-driven continuous environmental improvement (Global Ecolabelling Network 2004). Labelling also causes confusion as there are thousands of labels and declarations. Without reliable and verified practices, consumers could be misled. The ISO has

standardized environmental labelling practices guiding the national and multinational programmes and schemes awarding ecolabels.

- Type I is a multi-attribute label developed by a third party
- Type II is a single-attribute label developed by the producer
- Type III is a declaration based on a full life-cycle assessment

Table 5. ISO 14020 standard family for Environmental labelling (ISO 2019):

<i>Standard</i>	<i>Description</i>	<i>Application</i>
<i>ISO 14020</i>	Environmental Labeling: General Principles	Sets out nine general principles that apply not only to labeling schemes but to all environmental claims, designed to promote accurate, verifiable and relevant information.
<i>ISO 14021</i>	Environmental Labels and Declarations: Self-Declaration Environmental Claims, Terms and Definitions	Sets out requirements for Type II labels, i.e. environmental claims made for goods and services by the producer.
<i>ISO 14025</i>	Environmental labels and declarations – Type III environmental declarations – Principles and procedures	Principles and procedures for issuing quantified environmental information about products, based on life-cycle data referred to as environmental declarations. A Type III environmental declaration presents quantified environmental data for a product with pre-set categories of parameters based on the ISO 14040 series of standards, but not excluding additional environmental information.
<i>ISO 14024</i>	Environmental Labels and Declarations: Environmental Labeling Type I, Guiding Principles and Procedures	Provides guidance on developing programmes that verify the environmental attributes of a product via a seal of approval.

A TYPE-I ecolabel is a label identifying overall environmental performance of a product (good or service) within a certain product category, and it is based on life cycle approach. It provides information that directs demand toward environmentally better options. The label is voluntary, independent, comprehensive and verified. It is based on impartial third party verification (in contrast to self-styled labels or producer's own claims), and requires sound scientific evidence. TYPE-I label is meant for products that meet established environmental leadership criteria, i.e. are distinctive in environmental performance in their [product category](#). The label is suitable for most of the sectors, but the most popular are consumer products, such as food, household products and paper. The process for awarding the labels is guided through standard ISO 14024:2018 "Environmental labels and declarations. Type I environmental labelling. Principles and procedures."

According to the Global Ecolabelling Network (2004), objectives of the Ecolabelling include:

- Protecting the environment
- serve as policy instrument for environmental protection
- Direct consumption to environmentally better alternatives
- Promote resource efficiency and improves reuse and recycling
- Encourage ecosystem protection, maintaining biodiversity, and proper management of chemicals in products
- Encourage environmentally positive innovations and leaderships
- Offer market opportunities: market niche for environmentally better products, positive corporate image, marketing advantage
- Build consumer awareness

The TYPE-I Ecolabelling criteria are set to award top performers in each product category and the performing standards are incrementally raised, which leads toward improved products and services (Ibid). In some market areas labelling is already important part of the consumer choices, while in other areas it can be considered more as a tool to raise consumer awareness.

A TYPE-II environmental Labelling is guided through the standard ISO 14021:2016 “Environmental labels and declarations – Self declared environmental claims (Type II environmental labelling”. The TYPE-II claims, statements or symbols are not comprehensive or given by the independent organisation. They are given by the producer for the product or its packaging, and typically cover some environmental aspect. (UNOPS 2009)

Various labelling systems have emerged, such as hybrids of ecolabelling, including narrower focus as normal ecolabelling programmes. These can focus on single sector or industry, only one environmental issue (energy saving, carbon emission etc.), or only one or some parts of the life cycle (product manufacturing, use, or recycling) (Global Ecolabelling Network 2019).

The Global Ecolabelling Network (2004) emphasises that the Ecolabelling schemes are based on voluntary participation and open access. Potential participants may also request for the development of ecolabelling categories and criteria for their products. The labelling programmes need to comply with environmental and other relevant legislation, and do not challenge any differences legislations in different jurisdictions. The ecolabelling should not cause any trade barriers, and products awarded should meet also other quality requirements and performance in comparable level to its alternatives. Life Cycle Analyses

According the Global Ecolabelling Network (2004), Ecolabelling participants include:

- Governments / administration providing funding, setting basis for environmental policies and the support instruments; public sector also procures products and services.
- Programme managers and authorities: coordinating, liaising with different stakeholders, and directing technical, marketing and administrative activities.
- Industry and commercial associations, retailers and companies: provide reliable information for criteria development – can be both service provider and procurer.
- Consumers: households, institutions and corporations generating the market impact. Consumer preferences need to be understood and recognized to generate effective labels.

Labelling scheme operator should be independent of any commercial interests; this applies also to the panels defining the product categories/criteria. The panels should have balanced representation of different stakeholders in panels (industry, environment, academia, consumers, NGO's, administration). The labelling process itself should be open, accountable, transparent, and open for observing, monitoring and questioning. Therefore it would benefit of good quality system. The criteria used should be public and developed in collaboration of relevant stakeholders. The schemes should also work business-like, i.e. be cost-efficient, response fast to market changes and have flexibility. This requires reviewing, product-category updating, and market and technology follow-ups. Consistence with the ISO 14020 series provides better legitimacy and soundness.

4. Business development approach

4.1. Sustainable Business Model Canvas

Business Model development is based here on the Osterwalder (2004) as "Conceptual tool that contains a set of elements and their relationships and allows expressing company's logic of earning money. It is a description of the value a company offers to one or several segments of customers and architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital, in order to generate profitable and sustainable revenue streams".

The CASE project (Competencies for a sustainable socio-economic development) was Erasmus+ project focusing on "the new ways of teaching and learning methods as well as a strong cooperation between higher education and business to enhance a sustainable socio-economic development in general and new forms of sustainability-driven enterprises in particular". (CASE 2018). The project generated also set of tools to support sustainable business development, such as Sustainability Performance Tool and [Sustainable Business Model Canvas](#) (CASE 2018b).

The Sustainable Business Model Canvas by CASE (Ibid.) build on the business model ontology and Business Model Canvas by Osterwalder and Pigneur (2010) and adds eco-

social costs and eco-social benefits as additional features. The Canvas is a planning tool, use of which results ideally into coherent business model. The model should then be translated into operational objectives, milestones, finances and communication activities (CASE 2018).

Eco-Social Cost evaluation includes also identification of the non-renewable resource use, and overall resource consumption; the LCA methods and [Common Good Balance Sheet](#) are mentioned as applicable tools. In Eco-Social Benefit evaluation, there is consideration over the beneficiaries, and if the benefits can be transformed into value proposition. Business model developers need to consider their beneficiaries (customers), if the product solves their problems or improves their situation, delivers specific benefits, and communicate why the product is good in environmental terms. For the Eco-Social Benefit analyses, tools mentioned are [Social Reporting Standards](#) and Common Good Balance Sheet.

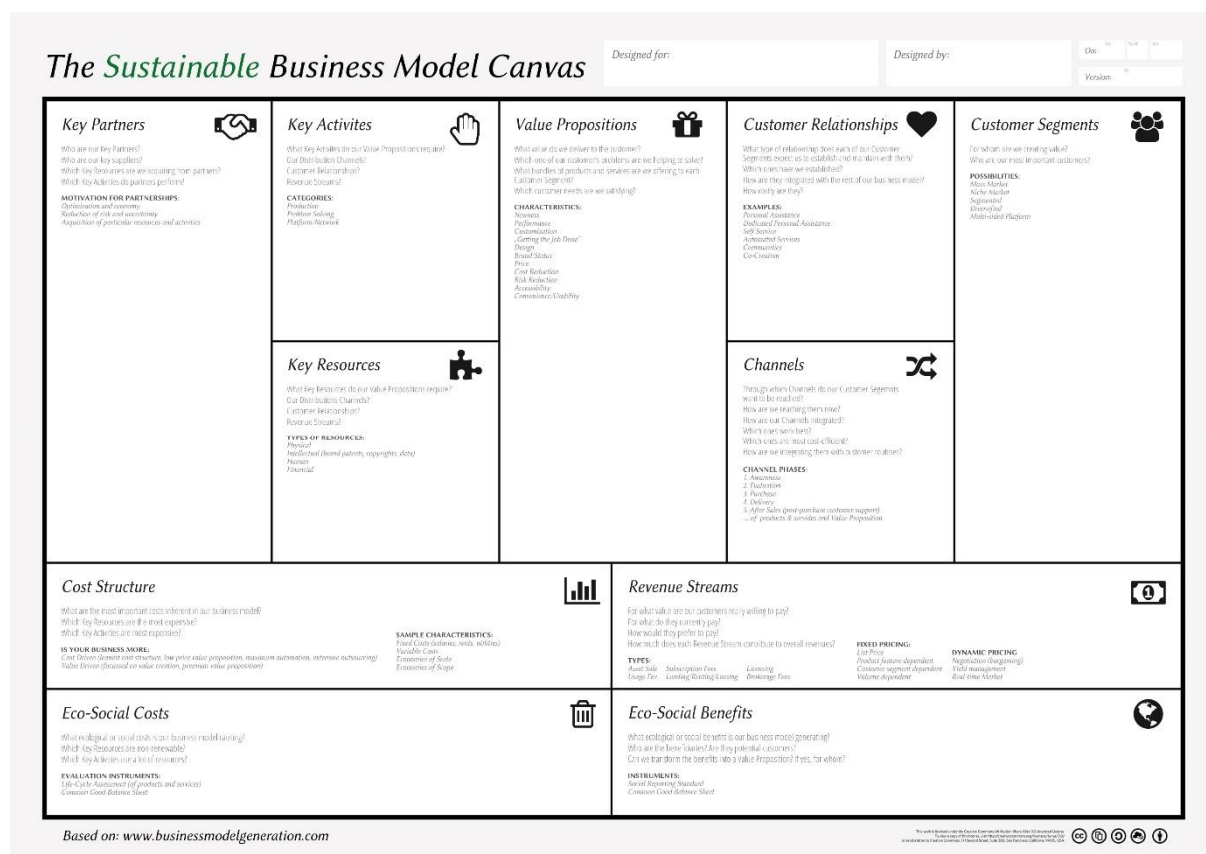


Figure 4. The Sustainable Business Model Canvas (CASE 2018b, CC 3.0 Share a like, based on Osterwalder & Pigneur 2010: Business Model Generation)

4.2. Considering the Sustainability Performance Indicators

Sustainability is a multi-dimensional concept which cannot be measured directly and therefore needs performance indicators to work towards social, economic and environmental objectives. The Sustainable Business Model Canvas illustrated below is based on extensive work by Obst (2015) in developing balanced set of Sustainable

Performance Indicators (SPIs) to supplement the Business Model Canvas by Osterwalder and Pigneur (2010). This extended framework contains 15 SPI basing on the German Delphi-panel. It can be used by practitioners to control and improve the sustainability performance of a business. (Obst, 2015a); however, this framework is considered only indicative as it is based on one-country panel. As a main difference to Canvas developed by CASE Project, this embeds sustainability into each section of the Canvas, covering also several Corporate Social Responsibility topics.

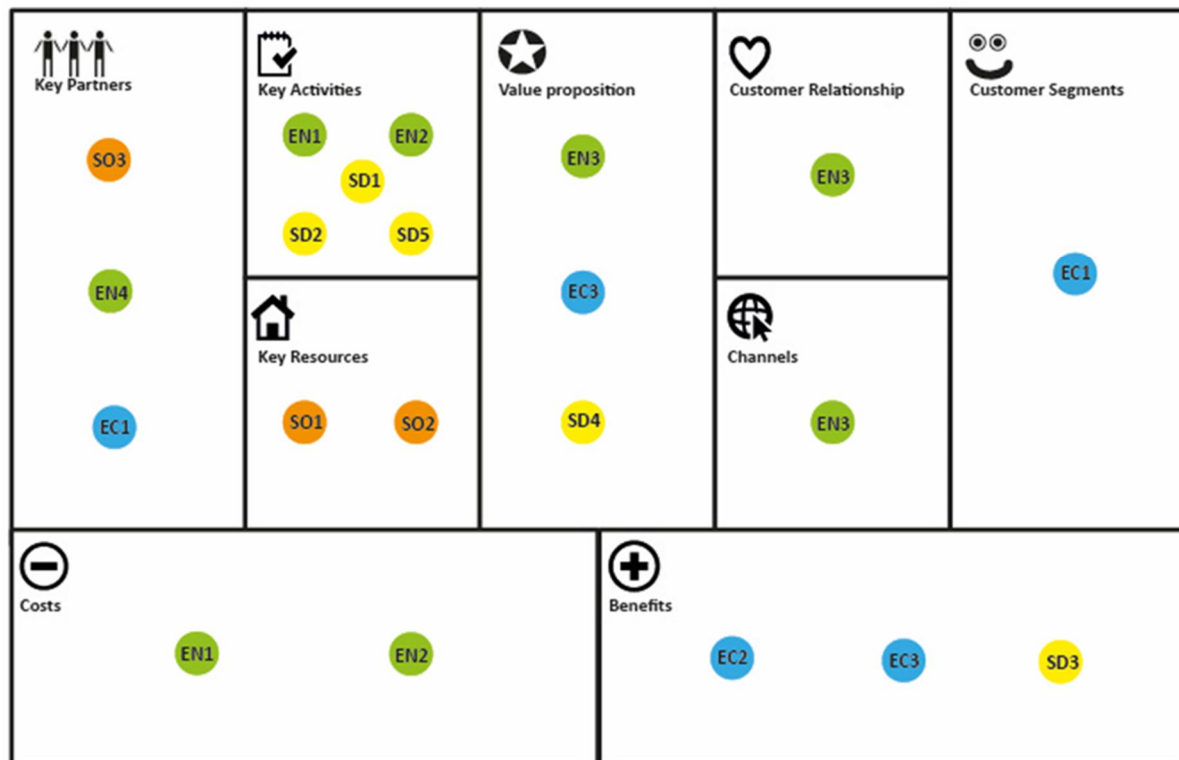


Figure 5. The Business Model Canvas and Integrated Sustainable Performance Indicators (Modified from Osterwalder and Pigneur 2010 and Obst 2015). The blue EC codes stands for the economic performance indicator. EC1 Target Beneficiary Socioeconomics; EC2 Social Return on Investment; EC3 Growth Rate. The orange SO codes stands for the social performance indicator. SO1 Employee happiness; SO2 Labour evaluation; SO3 Safety and security. The green EN codes stands for the environmental performance indicator. EN1 Waste generated; EN2 Greenhouse gas reductions; EN3 Reputation and transparency; EN4 Sourcing evaluation. The yellow SD codes stand for the standard disclosure indicator. SD1 Social impact objectives; SD2 SPI Weighting; SD3 Operational model; SD4 Value creation statement; SD5 Environmental impact objectives. (Obst, 2015).

The sustainable performance indicators with their code and their measurement in the framework can be interpreted as follows:

Economic performance indicators:

Target Beneficiary Socioeconomics (EC1): The entrepreneur should specify in 'Key Partners' which *low income socioeconomic groups* are targeted by the company. They can use the stakeholder analyses as a starting point and should footnote the type, context and assumptions while specifying the socioeconomic groups.

Social Return on Investment (EC2): The entrepreneur should calculate for 'Revenue Stream' the *SROI ratio* between the 'Value Proposition' and the 'Revenue'. This can be done for example through online tools such as [Social Profit Calculator](#).

Growth Rate (EC3): In the element 'Revenue Stream' The entrepreneur should calculate the increase of variables within a period. They should footnote the type of variable and choose one economic, one social and one environmental metric. For example turnover, profit, employment, and environmental outcome.

Social performance indicators:

Employee Happiness (SO1): In the element 'Key Resources' The entrepreneur should indicate if within the business an employee happiness evaluation is in place. If not, the business should consider to have a process in place where they get feedback from their (seasonal) employees and a method to measure their happiness. They should footnote the process and frequency of getting the feedback.

Labour Evaluation (SO2): In the element 'Key Partners' The entrepreneur should describe the process established to identify, among all of their whole suppliers and stakeholders, the significant risks for compulsory or child labour. They should footnote the measures taken against forced or compulsory labour.

Safety and Security (SO3): The entrepreneur should describe in the element 'Key Resources' the process and policy in place to monitor, evaluate and guarantee the (social) safety and security of an employee. They should footnote the type and context of this policy and process. For example fire security, process safety and service safety.

Environmental performance indicators:

Waste generated (EN1): The entrepreneur should describe in the elements 'Key Activities' and 'Costs' the total amount of waste generated in a specific time period. They should footnote the type of waste, context and assumptions.

Greenhouse gas reductions (EN2): The entrepreneur should describe in the elements 'Key Activities' and 'Costs' the amount of reduction in greenhouse gas emission within a specific time period. They should footnote the energy type, context and assumptions. For instance, [WWF Climate Calculator](#) can be used as a free online tool to calculate the carbon

footprint of the business. In addition, emissions can be compensated through standardised services.

Reputation and Transparency (EN3): Within the elements 'Value Proposition', 'Customer Relationship' and 'Channels', the entrepreneur should describe the way the environmental impacts of the business will be presented. This includes certificates, memberships and other honours received from third parties. Information from the *environmental review* (policy, environmental aspects and impacts) can be used to shape this indicator.

Sourcing Evaluation (EN4): Within the element 'Key Partners', the entrepreneur should evaluate the *environmental performance of the suppliers at the hand of recognized standards*. They should footnote the checklist and measures of the evaluating process. The stakeholder analysis can be used as a starting point to go through all of the stakeholders.

Standard disclosure indicators:

Social Impact Objectives (SD1): The entrepreneur should describe within the element 'Key Activities' the social impact objectives which they want to achieve. For example *community development or increased quality of life*.

SPI Weighting (SD2): The entrepreneur should describe *the scope, boundaries and relevance of the used SPI's* within the element 'Key Activities'. They need to determine *if a certain weighting is necessary for each SPI*. They should footnote the type, context and assumptions of their used weightings.

Operational Model (SD3): Within the element 'Revenue' The entrepreneur should describe the operational model it has.

Value Creation Statement (SD4): In the element 'Value Proposition' The entrepreneur should describe how they create or reduce value regarding to the economic, social and environmental dimensions.

The entrepreneur can use the information of the responsible certificate, quality system certificate and other certificates and labels for the economic and social information. They can use the information from the environmental reviews and LCA for the environmental information.

Environmental Impact Objectives (SD5): The entrepreneur should describe within the element 'Key Activities' the *environmental objectives* which they want to achieve. For example emission reduction or sustainable energy use. These can also be expressed in the environmental or sustainability policy.

4.3. Examples of Green Business Models in the Northern Peripheries

Atlantic Leather, Sauðárkrókur, Iceland

Atlantic leather is a family company located in North Iceland. The company, employing 19 persons, focuses on tanning and manufacturing of mainly sheep and fish leather products. They are the only tanner in Iceland and also only fish leather tannery in Europe. Atlantic Leather manufactures leather products for the fashion industry, and has been awarded several times, e.g. top tannery in Europe 2016 award. The raw materials used are mainly by-products from the food and fishing industry, and their suppliers are mostly local producers.

The Atlantic leather is committed to the sustainable development and this is expressed in their website (Atlantic Leather 2019). They emphasise the use of by-products, clean geothermal energy and hot water, and correct purification of waste waters. Their process development emphasises:

"We have from the beginning had the goal to use not hazardous chemicals in the production and all development have been worked from that point."

"We use soap, the soap has similar ingredients as dish washing liquid, we use lime to remove the scales with crucial help of enzymes, and tanning is play of PH and to control that we use baking soda and formic acid in the tanning. In the process we have to remove all natural fat from the skin, but to have soft leather we need fat. So the natural one is replaced with special fat created from vegetables oil and fish oil. For the tanning (conservation for the collagen) we use chrome as basic supported by aluminium and synthetic tanning agents. Chrome is available in several forms (chrome 6 is the poison one with bad reputation) we use chrome 3 that is not dangerous in that form, in the tanning it's possible that the chrome changes into other forms of chrome. Test have shown that it doesn't happen in our process. We also offers other tanning methods where we use tree bark to make the tanning, we use Mimosa tree bark (other type can be used). When it comes to dyeing the skins, we always use AZO free dyes. For the finishing we use water based acrylic and urethane based compounds (similar to paint we use in our homes)."

The stakeholder requirements from the fashion industry raise the importance of the business sustainability. The products are based on both Icelandic tradition (use of fish leather) and innovation (manufacturing of new materials). Product quality is controlled and monitored in detail, and quality classifications are in use. The process has also potential environmental impacts (Table 6), which are identified and controlled.



Figure 6. Tanning process has several phases and not all of them are yet automatized. Working site conditions and ergonomics is considered according to the sector recommendations and audited annually.

Table 6. Preliminary Review of environmental aspects and impacts related to leather tanning industry. Based on the visit at Atlantic Leather April 2019, and background materials provided by the company.

ASPECT	(Potential) IMPACT	Management
Raw materials <ul style="list-style-type: none"> Fish/sheep by-product (leather) Not in danger (commercial) fish Plastic/micro fibre film Adhesives (solvents) Chemicals 	<ul style="list-style-type: none"> Reduced waste Avoided use of endangered species CO2 emission/microplastics Toxic, Ecotoxic, or Renewable –based options? CO2 impact. Toxic/Ecotoxic 	<ul style="list-style-type: none"> Local supply chains MSC/NSC Certifications Proper waste management, chrome as landfill waste (0,2 t/a), bio waste management Development of better adhesives and solvents in Horizon2020 project (fish leather in fashion industry) Suppliers meeting REACH requirements; European suppliers with quality controls
Processing <ul style="list-style-type: none"> Energy consumption (freezers, processing) Water Tanning agents: Chromium, Aluminium, vegetable agents, soap, sodas, acid, finishes and waxes (solvent free acrylic binders), metal finishes 	<ul style="list-style-type: none"> Hydropower – Renewable energy Natural sources of hot geothermal spring water Potential ecotoxicity, water impact 	<ul style="list-style-type: none"> Chrome-free tanning / less harmful chrome in use, mimosa bark tanning. Controlled use of chemicals and water purification
Transportations	<ul style="list-style-type: none"> Use of fossil fuels, atmospheric emission 	<ul style="list-style-type: none"> Local supply chains (international trade?)
Chemical storage	<ul style="list-style-type: none"> Chemical hazards, fire 	<ul style="list-style-type: none"> Chemical management planning, fire safety inspections
Quality management	<ul style="list-style-type: none"> Waste/material loss Reuse/repair 	<ul style="list-style-type: none"> Quality categories and markets accordingly Durability, strength, recyclability Reuse of old products, Cooperation with schools in recycling, customer service
Human Resource Management	<ul style="list-style-type: none"> Health & safety 	<ul style="list-style-type: none"> Best use of chemicals Best manual working practices (inspected) Staff training

Atlantic Leather has identified its main environmental aspects and impacts, and also communicated these to their stakeholders and to the public. In addition, they are involved in the Horizon 2020 collaboration to identify and develop more sustainable adhesives, and also in development of Chromium-free tanning processes. The company is an example of the importance of stakeholder collaboration and communication in environmental issues, as the sector has some environmental concerns. Through the transparent processes these concerns can be reduced and business advantage of green markets utilised.

Äksyt Ämmät, Nurmes, Finland

Äksyt Ämmät is a tourism company that offers tourists “unique experiences in the Finnish nature with samples of Karelian culture and cuisine” without compromising the nature on which its activities depend. This is done through networking and collaboration with other local stakeholders. Their customers stay in small, family-run guesthouses, eat in local restaurants, and maximize the use of local transport and other tourism services. The restaurants and catering companies also commit to use of local ingredients.

Äksyt Ämmät is committed to the continuous sustainable development of business practices together with its stakeholders. The following activities are being committed to in order to achieve this:

- Reducing the emissions of greenhouse gasses and use of non-renewable resources and compensating the CO₂ emissions from the flights from our 150-200 guests from abroad each year through www.atmosfair.de
- Reducing the production of waste and reuse the kitchen and garden waste for its compost. Advice is given to customers to minimize the use of energy, water, towels and clothes as many times before giving them to the wash.
- Using eco-electricity, buying organic and local food, using eco-friendly detergents in washing and dishing and have organic or Finnish textiles in clothing. In possession of an oil tank for the heating of the sports hall, although the consumption is already reduced to half, the goal is to replace the oil tank with a sustainable energy alternative.
- As a evidence of the sustainability commitment, Äksyt Ämmät is certificated for Corporate Social Responsibility ([TourCert](#)), Laatutonni quality 1000 certificate, [Karelia a la carte label](#) and is partner of the [North Karelia Biosphere Reserve](#) which is part of [Man and Biosphere Programme](#) to improve sustainable development.
- Äksyt Ämmät meets all the legislation and mandatory requirements from the Finnish government, and seeks to meet all the needs and expectations of its stakeholders.



Figure 7. Sustainable tourism, Äksyt Ämmät, Finland. (Picture Äksyt Ämmät Ltd.).

The case of Äksyt Ämmät is an example of sustainability partnerships, integration of the sustainability as part of the company's policy and as important part of the overall business model and value creation. In addition, the collaboration with local food and nature product manufacturers, as well as other service providers, creates opportunities for a sustainable micro-cluster development.

4. Conclusions

The aim of this report was to define the conceptual background for the green business model framework. This was done by gathering together some main approaches in environmental management, EcoDesign, and business model development. As the topic itself is very broad and has number of different methods and tools, here the framework remains in generic level. The suggested path includes a) organizational approach on sustainability, b) product -based approach, and finally, c) business development approach. These all need to be considered and understood to create and maintain viable and sustainable business practices.

The framework does not cover the marketing aspect and tools as they are developed in other work package during the Digi2Market project. However, the green digital marketing can be built on the contents that are derived from the green business framework and its applications in small- and medium sized enterprises (SMEs) located in the northern peripheral areas of Europe. The stories of the sustainable business practices can be communicated through the virtual marketing, to convince customer and other stakeholders, but also and thus inspire others to adopt better practices.

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