



EFORWOOD
Sustainability Impact Assessment
of the Forestry - Wood Chain



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EFORWOOD

Tools for Sustainability Impact Assessment

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APPENDIX 1 – SWOT fundament

APPENDIX 2 - MANUAL OF METHODOLOGY FOR CONSUMPTION SCENARIO BUILDING

1 Introduction

M5 is the EFORWOOD module focused on consumption research. M5 has a role as consumers´ and customers´ pulse detector and link between market and industries. The importance of consumption as a significant development driver must be taken into consideration when investigating the sustainability of forest-based industries. Producers need to be closer than ever to customers and end-users, as globalisation implies new

challenges and threats for European industries. Consumers and customers are key players for implementing sustainable policies within forest-based industries: the assimilation or refusal towards products may be crucial for the sustainability of forest-wood chains in next years.

There is a great necessity to provide an analysis on the attitudes and perception of consumers towards wood based products and their substitutes from the point of view of the forestry-wood chain sustainability concept.

Eforwood partners should obtain relevant information about the characteristics of the consumer and customer markets, the acceptance of the FWC products, and on consumer preferences related to final products. They also should have good quality information on the impacts of buyers' actions, behaviour and preferences on sustainability in general terms and on the three pillars of it: economic sustainability, social sustainability and environmental sustainability. These are essential information for all the forest-based industries to be taken into consideration for a sustainable well functioning.

2 Objectives

The overall purpose of this WP is contribution with knowledge in order to increase pro-activity for the FWC.

A final objective is to develop and suggest strategies for increased sustainability for significant FWC-products and market sectors.

A partial objective of this WP is to develop and apply a partial M5 qualitative SIA process tool.

For the period up to month 30, the specific objectives are to:

- Develop market driven scenarios to be used as context for further WP5.3 work as well as in ToSIA applications.
- Summarise collected data and existing relevant data from WP5.1, WP5.2 and other modules, to be used as a platform for further work and the SWOT analysis to be executed after Month 30
- Decide on methodology and structure of the partial M5 qualitative SIA process tool
- Develop a plan for the further work in the WP

The goal of this report is to present the progress towards the specific and agreed objectives up to month 30.

3 Attitudes on sustainability in the context of FWC-based final products – Results from WP5.2 in summary

During the previous research work conducted within work packages 5.1 and 5.2 there was a difference made between the end users and the professional buyers, and there were identified different environmental consciousness levels of end-consumers.

Our earlier results also highlights that in Europe consumers are not valuing only the price and functionality of the products, but intangible assets as well.

Previous research focused on four categories of FWC final products such as:

1. Solid wood products – furniture
2. Fibre-based packagings – juice packaging
3. Fibre-based printing products – books
4. Bio-fuel products – pellets

3.1 Furniture

End Users

In Spain, the consumers have ambiguity about wood as environmentally sound material. In Sweden there is a common perception of the end users that wood is environmentally sound.

Advantages of solid-wood furniture are the followings: good quality, nice design, warmth, it is a long-lasting material, convenience, social acceptance.

Disadvantages of solid-wood furniture are the followings: high price, maintenance of a living material (humidity, dry...), transport/ disposal.

Professional Buyers

Professional buyers are not considering sustainable aspects when purchasing furniture, although may show communicating labels related to environmental concern.

Advantages:

- Design capabilities
- Adaptation to project
- Ordering

Disadvantages:

- Fast wearing out process
- Old image for modern establishments
- Need for adaptation to safety conditions for public use of furniture

3.2 Packaging

End Users

In Spain: Neutral perceptions although habitual use. After glass, is the second in the price ranking. Glass is main competitor material due to quality perception.

In Sweden: it is perceived to be environmentally sound (recycling), light to carry, functionality.

Costs: Reduced perception of costs (Spain: not always available infrastructure for recycling)

Advantages: Easy storage, easy handling, easy carrying.

Disadvantages: Functionality, boring design, difficult to flatten.

Professional Buyers

Professional buyers are not paying particular attention for total sustainability aspect (3 elements), and there is no willingness to pay extra.

There are existing emotion values which are the followings: No strong fibre-based packaging preferences have been recognised

Costs: Mixed opinions; according to retailers and wholesalers it is cheaper than other materials

Advantages: Easy to recover and recycle (common), easy to expose, less problem with leakage, easy to transport, good printability, have good functionality in the refrigerated display counter and are easy to handle.

Disadvantages: Heavy, low image, difficult to vary design, not flexible

3.3 Printing industry

End Users

Costs: there are no relevant costs.

Advantages: Acceptable price, easy handling, recycling, social acceptance for elder consumers, not for young people (due to time shortage).

No significant attitude toward books as sustainable good.

Professional buyers

No particular attention for total sustainability aspect (3 elements), and there is no willingness to pay extra.

According to professional purchases there is a certain emotional value carried by the books, and this value is tradition.

Costs: Environmental labelling and certificates required by retailers
Combination of price and total quality

Advantages: Paper books catch readers' attention in a specific way and the visual memory is working better.

Disadvantages: Lot of storage space, heavy, easy to damage and costly to replace, complementary sources required, difficult to update.

3.4 Pellets

End users and professional buyers

Advantages: It is a combustible that is environmentally sound, ecologic, and from the point of view of sustainability is satisfying the criteria. Low running cost compared to oil/gas energies, and it is not depending on fossil fuels.

Disadvantages: There is a bigger one-time investment (pellet heating system), and a large storage (space) facility needed. The maintenance and cleaning are requiring time, effort and money.

3.5 Consumers´ attitude on sustainability

There are big differences observed on sustainability in Europe´s different countries. Generally the consumers in Sweden and Germany are well informed on the environmental and sustainability issues. In Spain the consumers´ attitudes on the topic are less consciousness.

3.5.1 Attitudes on sustainability in Spain:

Description

Attitudes are much diversified.

- Spanish consumers are price-sensitive when talking about sustainability, although other factors such as quality, service, design and social acceptance are also important when purchasing different products.
- In case of furniture, besides the price, there are other things influencing the buying process: the structure of the family, the design and the quality, and also the functionality. Aspects of sustainability are not appearing in their preferences.
- In case of juices the design and appearance is the most important factor besides quality. Spanish consumers like trying the novelties, they like trying products that are having different packaging from the conventional ones, or they have not seen before. Sustainability is not appearing in their decisions on buying juices.
- In case of books Spanish consumers are interested in the contents. For their personal use they are buying paperback editions that are the less expensive and most functional ones. Sustainability as a factor does not play any role in buying books.
- The knowledge of Spanish consumers on sustainability is very basic, and generally they are not paying too much attention to it when they are buying. The environmental activities of Spanish households are not going further than collecting waste selectively, and this is still a spreading process.

- The Spanish consumers are not in possession of enough information about the environmental characteristics of wood, they are confused and their knowledge is ambiguous about the topic; they can not decide whether wood is ecologic because it is recyclable and natural, or non-ecologic, because by using wood, nature and environment is suffering a harm.

Recommendation

- Spanish consumers need education on general environmental issues and also on sustainability.
- Communication of sustainability and all environmental issues should be credible and the cost of credibility should be paid by the producers (use of symbols, investing in publicity, etc.). The producers should take care of the communication, and build credibility, because amongst the Spanish consumers there is a certain scepticism concerning the producers' and politicians' declarations. T
- The extra costs of environmentally sound products, and packaging should be covered by the producers, because the consumers are not willing to pay any extra amount regarding the environmental aspects of a product.
- Spanish consumers consider that legislative regulation could be the only way for assuming general sustainable behaviours/products, because on voluntary base a part of the society is not willing to pay more. Spanish consumers are missing the activity of the community in environmental issues (organizing better public transportation, etc.).

We have no further investigated consequences of the transfer of "environmental costs" from the industries to consumers neither tools of transfer such as educational policies.

3.5.2 Attitudes on sustainability in Sweden:

The Swedish society is well informed about the environmental issues and also the about sustainable development.

- In the Swedish consumers' daily life the concept of sustainable development means; choosing products with a label (for an environmentally friendly alternative or for "fair trade"), housekeeping with resources (energy, water), sort out household waste and to teach the young children not to waste and throw away. The use of public transports, reuse and recycling of the products together with an active choice of eco-labelled products
- Swedish consumers are environmentally conscious.
- Functional and eco-friendly packages and products preferred by Swedish consumers, price along with product durability, are the main parameters.
- In case of furniture probable manufacturing processes and their impact on the environment is also an important aspect, on top of functionality, design and price.

- Carton packages are considered as the most environmentally sound one. Fibre-based products and packages are preferred on environmental reasons.
- Regarding the books, paperbacks are preferred by Swedish consumers. The main reasons for their choices are weight, price and environmental aspects. The paperback is considered to be the most environmentally sound format for the books.
- Swedish consumers would like to act in a useful way concerning sustainability; they would like to take active part of actions towards sustainable development by their attitudes and behaviour.

3.5.3 Generally Consumers in Europe

According to the conclusions concerning sustainability detailed above there are **two main profiles of consumers** in Europe, with the following characteristics:

CONSCIOUS CONSUMERS

- Social consciousness about sustainability.
- Trust on sustainable information labels.
- Political concern about sustainability impact and social/ economical responsibility of rich countries.
- Limited willingness to pay extra for sustainable products.

NOT CONSCIOUS CONSUMERS

- Lack of information about what sustainability is and its dimensions.
- Sustainability is thought to be linked exclusively to environmental aspects.
- Certain attitudes towards sustainability (especially recycling), coming from companies' culture and new generations.
- No trust and scepticism: sustainability is perceived as just a trend: marketing and political purposes without real facts (credibility problem).
- No willingness to pay extra for sustainable products.

In professional markets, (business-to-business) main profile is the not conscious one, although companies may try to show an ecological friendly image to markets.

There is a very important question of credibility, as some consumers find sustainability arguments to be spurious, so they are sceptic about them (they think sustainability as a fashionable or politically correct issue). Hence, educating people and making them aware of sustainability importance when consuming wood-based products, will have some costs of credibility. These costs (advertisements, consciousness campaigns, etc.) should be assumed by the producers or governments.

The final comment can be formulated as *recommendation*:

There is a need for consumers' education and investment on credibility about sustainability (needs, attitudes, benefits, etc.).

4 Preparing fundament for SWOT analysis

4.1 Introduction

SWOT analysis was a result of the research carried out at Stanford Research Institute from 1960-1970.

SWOT was first time promoted in UK by Urick and Orr as an exercise in and of itself. As such it has no benefit according to Alan Chapman. It was concluded that it was needed the sorting of the issues into the programme planning categories of:

1. **Product** (what are we selling?)
2. **Process** (how are we selling it?)
3. **Customer** (to whom are we selling it?)
4. **Distribution** (how does it reach them?)
5. **Finance** (what are the prices, costs and investments?)
6. **Administration** (and how do we manage all this?)

A SWOT is a subjective evaluation of data which is organized by the SWOT system into a logical order that helps understanding, arrangement, dialogue and decision-making. The four dimensions S, W, O, and T are a useful extension of a basic two heading list of pro's and con's. SWOT is a short form for **S**trengths, **W**eaknesses, **O**pportunities, **T**hreats.

Description of the subject for the SWOT analysis should be evident in order to properly understand the purpose of the SWOT assessment and implications. Important issue is a desired end-state, which means that objective is agreed upon and defined before conducting a SWOT analysis.

Objective

Based on Eforwood main objectives we can state that SWOT objective is a sustainability of fiber-based industries such as solid-wood products, packaging, printing and publishing, and bio-energy.

The aim of SWOT analysis is to identify the key internal and external factors that are important to achieving the objective.

4.2 Methodology

Process of preparing fundament for SWOT analysis is a sequential and multiplies methodology in order to establish a consistent approach between the issues, challenges, needs and results required while dealing with development of strategies to increase sustainability for significant FWC-products and market sectors.

The methodology structures a more uniformed method in consolidating and assessing challenges as well as guiding through the value chain. The method allows:

- a step-by-step and responsive approach allowing participants to understand the steps undertaken, topics to discuss and the relationship of each step;
- participants to focus on priorities, performances, overcome difficulties and challenges and adapt to change prior to the next activities;
- greater control in achieving objectives of the on the project; and
- establishment of the effectiveness of the tackling complex formulated problem

Process of building fundamentals for SWOT analysis has been divided in two parallel directions in order to cover:

- Case study and hot spots analysis for Internal factors – The **S**trengths and **W**eaknesses internal to the sector.
- Scenario creation process for External factors – The **O**pportunities and **T**hreats presented by the external environment of the sector.

5 Case study and hot spots analysis

Internal factors

- Strengths: attributes of the organization that help achieving the objective.
- Weaknesses: attributes of the organization that can harm while achieving the objective.

Strengths and weaknesses of fibre-based sectors are selected based on results of previously conducted by M5 partners research parts of Eforwood such as:

- Literature review regarding sustainability issues of fibre-based sectors and
- “Case study Eforwood 5.2” as well as
- “Summary analysis report on consumers, wood based products and substitutes in the light of the forestry-wood chain sustainability concept including the identification of hot spots”

Achieved result presenting Strengths and Weaknesses See: Appendix 1

6 Scenario creation process

6.1 Introduction

Definitions of scenario methods differ from being a single method of visioning the future, to describing all futures methods that describe alternative futures (Bishop et al. 2007). Descriptions of alternative futures are not necessarily a story of the future, but may as well be a trend line or a probability tree.

Scenario methods can be divided into several groups depending on their output, process or starting point etc. One categorisation made by EU foresight project FORLEARN is:

- Quantitative vs. qualitative
- Exploratory vs. normative
- Predictive vs. open

- Reliance on creativity vs. reliance on evidence (FORLEARN webpage) action

Another method is based on the nature of the object studied (L. Börjesson et al),

- Low uncertainty, forecasts, projections
- High uncertainty
- Normative, back casting,

Dimensions of uncertainty

The reason for using scenarios in the first place is the uncertainty inherent in predictive forecasting. We never have all the information; theories of human behaviour are never as good as theories of physical phenomena, and finally we have to deal with systems in chaos and/or emergent states that are inherently unpredictable. Scenarios in this section, then, are constructed by first identifying specific sources of uncertainty and using those as the basis for alternative futures, depending on how the uncertainties play out.

Morphological analysis (MA) is one of methods belonging to this section.

The term **morphology** comes from classical Greek (*morphe*) and means the study of **shape** or **form**. It is concerned with structure and arrangement of parts of an object, and how these "conform" to create a whole or Gestalt. The "objects" in question can be physical objects (e.g. an organism, an anatomy or ecology) or mental objects (e.g. linguistic forms, concepts or systems of ideas). The first to use the term *morphology* as an explicitly defined scientific method was J.W. von Goethe (1749-1832), especially as concerned his "comparative morphology" in botany. Today, morphology is associated with a number of scientific disciplines in which formal structure, and not necessarily quantity, is a central issue. In linguistics, it is the study of word formation. In biology, it deals with the form and structure of organisms, and in geology with the characteristics, configuration and evolution of rocks and land forms. (Tom Ritchey, 2002-2006). Summarizing, morphological analysis (MA) is a method for recognition and examining the entire number of possible configurations existing in a defined problem complex.

Morphol is a computer program that also manages the complexity of morphological analysis. Developed by Michel Godet, a prominent futurist in Europe, MORPHOL performs the standard morphological analysis, but it then reduces the total number of combinations based on user-defined exclusions (impossible combinations) and preferences (more likely combinations). It also provides an indicator of the probability of each scenario compared to the mean probability of all scenario sets based on the user-defined joint probability of each of the alternatives in the set (see Godet and Roubelat, 1996).

6.2 Scenario building process

M5 Scenario creation process is based on Morphological Analysis (MA) methodology.

Zwicky in his work *Discovery, Invention, Research through the Morphological Approach* (Zwicky, 1966) defined five steps of scenario building process and actions that should be taken as a response on the formulated problem:

First step. The problem to be solved must be very concisely formulated.

Second step. All of the parameters that might be of importance for the solution of the given problem must be localized and analyzed.

Third step. The morphological box or multidimensional matrix, which contains *all of the potential solutions of the given problem*, is constructed.

Fourth step. *All the solutions* contained in the morphological box are closely scrutinized and evaluated with respect to the purposes that are to be achieved.

Fifth step. The optimally suitable solutions are selected and are practically applied, provided the necessary means are available. This reduction to practice requires in general a supplemental morphological study."

Each partner of M5 will prepare own matrix focused on relevant industry sector, however after the common problem has been formulated.

Result achieved from Morphological Analysis will create input to SWOT analysis, particularly External Factors – the **O**pportunities and **T**hreats presented by the external environment.

- **O**pportunities: conditions that can help in achieving the objective.
- **T**hreats: conditions those are harmful while achieving the objective.

7 Further work

A tentative time schedule as well as frame has been prepared for partners. Within those frames, partners in WP5.3 have to focus and prioritise research activities to comply with the plan as below.

7.1 Actions plan

- To produce complete document containing Internal factors
- To be familiar with Morphol as a IT based tool while morphological matrix
- To create morphological matrix for respective fibre-based sectors
- To identify External Factors
- To compose complete SWOT document
- To analyse SWOT
- To develop strategies based on SWOT analysis

7.2 Methodology

- 1) In order to achieve unified result while using Morphol and creating scenarios, "MANUAL FOR METHODOLOGY FOR CONSUMPTION SCENARIO BUILDING" has been elaborated by AIDIMA. See: Appendix 2

- 2) Practical exercises are necessary in order to secure M5 partners integrated perspective on MA while creating matrix

8 References

PD 5.2.2 Costs, benefits, criteria weights and trade data for M1; Case studies

PD 5.2.1 Report on literature review; Attitudes and perception towards FB products and the sustainability concept

PD.5.2.3. Case study report containing analysis of the most relevant value chains from a FWC sustainability, consumer/market and macro-economic perspective. The report is based on a range of qualitative and quantitative methods including surveys, interviews and focus groups.

D 5.2.4 Summary analysis report on consumers, wood based products and substitutes in the light of the forestry-wood chain sustainability concept including the identification of hot spots.

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APPENDIX 1 – SWOT fundament

This document is dedicated to fundamentals for SWOT analysis.

Appendix 1 consists of three main parts covering forest based sectors:

Appendix 1.1 – solid wood products

a) construction products

b) furniture

Appendix 1.2 – bio-energy

Appendix 1.3 – packaging and books

Each part has been created by responsible partner: 1.1 a – FCBA; 1.1 b – AIDIMA; 1.2 – Pöyry and 1.3 – Innventia.

Construction Wood Products

Results have been obtained with the contribution of Pierre Monfils, in charge of the development of construction wood products at the FCBA.

Strengths:

Environmental:

Recyclable and renewable product.

Low pollution and low consumer of energy especially during the transformation and the transportation (distance and density) processes.

Stocks CO2 for a long period (lifetime of the house).

Substitution to products based on fossils materials.

Practical:

Weight, modularity, malleability allowing time saving in house construction.

Construction of prefabricate houses.

Thermal, insulating, no-magnetic, acoustic, safe properties.

Endowment:

Substantial investment in Physical capital in the last years.

Market:

F: Wood products distribution sector benefits from a good density and territorial distribution. I assume the wood product distribution proper to the wood products sector.

Price: when the house is perceived on the long term.

Exemple: If consumers take into account the price of heating on the following 20 years price will be substantially lower compared to a house made of cement.

Weaknesses:

Price: when the good is perceived on the short term.

F: Production is not enough concentrated and then does not allow any scale economies. There are too many and small production unit.

F: Sector made of small size companies.

F: Supply of services such as the “wooden house” is not enough developed. Prefabricated wooden houses is not a product very developed in term of quantity and diversity available.

Endowment:

Shortage labor, lack of specific human capital in the sector (lack of “wood builder”).

F: The sector is not seen as attractive for the labor force.

F: Training not enough developed.

F: Lack of usable raw material (wood is not dried enough after saw-milling).
Internal to the sector.

Structure:

F: Innovation culture and process are not developed enough. It suffers from an atomized production as well as a lack of coherency of producer union and a low level of communication between actors. It may be a vocabulary mistake. I mentioned the low level of communication between agents/companies from the forest exploitation up to the joinery producer (ie the sawmill, the factory and the distributor do not communicate enough between each other). They only look at their own interests and at the sectoral interest as a whole. It generates a lack of cooperation, decreasing the competitiveness of the sector.

Lack of supply for public markets. If there is only one supplier of wood construction on local public market, the deal cannot be done. For an invitation to tenders for a wood based construction, it happens that only one wood based producer exist, canceling automatically the project because of a lack of competition.

F: is referring specifically to the French case. It is mentioned in case of the point described is similar in others European countries.

Opportunities:

Market:

Benefits from a good a positive temporal trend in term of price tension (compared to its competitors, its price increases less than them).

Consumer perception:

F: Each generation has a proper positive perception of wood products. Match with the demand for more traditional goods with “old” generations and the demand for designed and environmental goods for young generations (“Momos”: Mobile – Morals).

Benefits from a large presence in the media (specialists and generalists).

Threats:

Consumer perceptions:

Negative impact on environment and on development of south countries (tropical forest not renewed).

F: Dangerous (diffuse fire): “the wood burns”.

F: It is seen as a material with a lack of resistance to time and external attacks (ie: consequences of Katrina). Consumers think wooden house physical aspect will be quickly damaged by the time.

F: Legislation or conservatism in the construction sector limits the development of wooden houses. Wooden house often assimilated as a chalet.

F: An investment in a wooden construction is not seen as a “patrimonial” investment.

Strengths of the EU-FWC from consumers and customers preferences' perspective in the light of sustainability and it's 3 pillars

CHAIN: SOLID WOOD

PRODUCT: FURNITURE

Market: B2C-B2B

Sustainability dimensions: Economic, Social and Environmental:

Strengths of the furniture industry in Europe were selected on the findings of some formerly conducted researches and studies within the frames of EFORWOOD M5. It is based on consumers' and customers' perceptions on furniture, the importance of key aspects at purchasing process and the level of their positive impact on sustainable development of the industry in general.

Grade of response on new demands created by European macro trends

Because of their size, the small and medium enterprises (SMEs) of the sector are flexible and are able to produce high **quality** furniture.

Quality

In all the segments of the industry and for all ends of the markets, the European manufacturers are able to produce high quality furniture.

Product assortment, purchasing availability

A very large number of companies can produce a wide choice of products.

Price, additional services, quality

In general, manufacturers' strategic plans focus on product **quality** and customer's **service** at an attractive and competitive **price**

Reputation and social acceptance

European brands have attractive names for consumers Branding is quite strong in some sectors such as kitchen and office furniture sectors.

Design, characteristics of products (performance)

European furniture are preferred by consumers for their advanced design.

Even if there are differences between countries, the European manufacturers' capability to create new designs and models is an undeniable competitive advantage.

Presence in Europe of the main international furniture fairs that set the trends for the future. Use of various types of materials (wood, metal, glass, leather, ...) is also a speciality.

A growing part of the furniture market is becoming fashion led, and more and more design is integrated in furniture.

User-friendly tools are available for manufacturers to formalize their product development strategy.

Functionality

In case of European furniture industry the functionality is one of the basic dimensions of the product required by the consumers

Social acceptance

Products of European furniture manufacturers are accepted socially by the consumers.

Market and trends knowledge is important among manufacturers the gradual position of furniture as a fashion item and not only a **functional** one: more and more consumers are open to the design message and to interior refinement.

Safety and health

Restrictions in Europe are very rigorous, and is very important for the consumers.

Corporate social responsibility

Is appearing mainly in the preferences of professional buyers, due to the widely spreading image and concept of the companies that they are working for.

Weaknesses of the EU-FWC from consumers and customers preferences´ perspective in the light of sustainability and it´s 3 pillars

CHAIN: SOLID WOOD

PRODUCT: FURNITURE

Market: B2C-B2B

Sustainability dimensions: Economic, Social and Environmental:

Weaknesses of the furniture industry in Europe were selected on the findings of some formerly conducted researches and studies within the frames of EFORWOOD M5. It is based on consumers´ and customers´ perceptions on furniture, the importance of key aspects at purchasing process and the level of their impact on sustainable development of the industry in general.

General industry weaknesses:

The consumer demands new social trends (security, ecology, social responsibility, etc) that are expected to be included in the basic dimension of the furniture for which is not willing to pay more.

Change in the consumers´ habits and behaviour at purchasing all kind of products and services (more requirements, immediacy, personalization, more information)

The furniture is not a priority in the household expenditures. The importance of furniture is decreasing compared to other consumption sectors share in the households´ monthly income.

The innovation in the furniture distribution business model is not occurring with the same rhythm as it is detected in other sectors (clothing, electronics, relax, services, etc)

The development of internet and new technologies are more significative in other consumer sectors than in the furniture industry.

The distribution does not encourage loyalty of consumers, as it is focused on the moment of buying and not on creating relations.

High labour costs, at least for the EU15-based manufacturers; labour costs (including social security) can represent up to a third of the production price in some countries.

Insufficient differentiation of product

Consumers and customers are not perceiving any additional value that is required according to the extended demands of buyers.

Local origin, corporate social responsibility

These aspects are not communicated well to the consumer, who does not perceive them. This way his aspect can not contribute to the sustainability of the furniture industry. High labour costs, at least for the EU15-based manufacturers; labour costs (including social security) can represent up to a third of the production price in some countries.

Insufficient modernization in the furniture sector

There has been a lack of investment in modern manufacturing technologies, specifically by small companies leading to an under-capitalization and a perception that the industry is behind other industries in the relation to the application of the technology. This is mainly due to the family-structure of the SME's.

The development of internet and new technologies are more significant in other consumer sectors than in the furniture industry.

Labour and education issues

Inadequate and/or expensive training for personnel.

Skills shortages of skilled workers and managers limiting expansion.

In some countries, the industry has an ageing workforce: despite its positive perceived image by the public, the industry has difficulties to attract new talents.

Length of purchasing process

The furniture buying is realized when there is a need of the consumer. In case this necessity does not exist, the consumer does not invest his freetime to buy furniture

Not using the opportunities provided by alternative distribution channels and new agents.

Costs of waste management/recovery, ease of sustainable disposal, recyclability, complete correct environmental information on labels

These are aspects which are not of main consideration for consumers and customers at making a buying decision, but does have a high impact on environmental sustainability.

It is also an important aspect that end users and professional buyers are not willing to pay extra for these characteristics.

Safety and health

It is a very expensive issue to fulfil the requirements of consumers and of strict European regulations from the point of view of competitiveness this issue is influencing the price with the fact this aspect must be included in the basic dimensions of the products.

Design

Numerous specialized magazines globally and within days, disseminates new furniture models and design that can be easily copied.

Lack of models and design protection both in Europe and in third countries. Manufacturers in emerging countries can copy products, manufacture them and bring them to the market only some weeks after the original is placed on the market.

Poor communication between designers, retailers, manufacturers and the consumers: too much "similar" in some segments of the market (no differentiation).

Many retailers (depending on the country) do not take risk to propose design and contemporary furniture.

Bio-energy – pellets

Strengths are based on results of previously conducted research parts of Eforwood related to the European pellet industry.

- Wood pellet is a renewable energy source
- Local supply inside Europe
- Efficient use of raw materials through creating valuable product from a low-value side stream

Weaknesses are based on results of previously conducted research parts of Eforwood related to the European pellet industry.

- Limited supply of raw material
- Extensive removal of wood residue for raw material generates need to fertilise forests
- Laborious energy source for small scale users
- Dependency on financial support
- Not totally emission free

Packaging

Strengths are selected based on results of previously conducted research parts of Eforwood related to the European packaging industry.

- Packaging industry developed efficiency concerning logistics, handle ability and storage on high level.
- Fiber based packaging is considered to be of low cost.
- Paper itself is a renewable and sustainable resource.

Weaknesses are selected based on results of previously conducted research parts of Eforwood.

- heavy packaging and packaging that are flimsy/easy to damage.
- reusability and re-close ability are not well developed functions
- lack of an environmental rating on packaging
- Design regarding fiber based packaging is seen to be boring and conservative.
- Variation of packaging regarding the size, shape, etc.
- Response to consumption trends
- Fiber based packaging is considered to have a low image and by this the packaging has a negative impact on the image of the product by itself while dealing with food and drinks.
- Fiber based packaging is considered to have a cheap image.
- packaging sector has meagre experience in acknowledging their environmental activities and promote their social responsibility
- cooperating with international bodies in order to enable development of wide perspective of packaging industry sustainability is weak.
- Understanding rules of cooperation with different customers and suppliers is generally recognised as crucial but not well represented.
- Identifying variety of demands, understanding them and their consequences, and satisfying them is not well developed process of activities

Books

Identification of Strengths of printing and publishing industry is mainly based on studies carried out in three different EU countries with focus on books. Results probably can be generalised for the entire printing and publishing sector.

- Long superior tradition as a reliable source of content
- Huge variations that can satisfy different needs and interests in the matter of content, layout, banding, price, etc.
- Developed different distribution channels in cooperation with multiple actors on markets
- Strong recognition of changing trends and consequently adjustment of internal processes
- Combine price and quality

Recognised Weaknesses are result of previously conducted studies by M5 within Eforwood project.

- Low level of Sustainability labelling
- Not satisfactory fulfilment of certification requirements concerning not child labour involved in production while production takes place in the own but in the country from outside EU.
- Not satisfactory recognised opportunities to reinvent the ways in which the industry packages knowledge and “goods” for human consumption.

Appendix 2 - MANUAL OF METHODOLOGY FOR CONSUMPTION SCENARIO BUILDING

Elaborated by AIDIMA

METHODOLOGY

Morphological analysis

Morphological analysis or General Morphological Analysis is a method developed by [Fritz Zwicky](#) (1967, 1969) for exploring all the possible solutions to a multi-dimensional, non-quantified problem complex. It is based on FAR (Field Anomaly Relaxation) thinking. There is future table / matrix (morphological space) to be built as a first step, followed by the estimation of variable values and dependencies between variables. Values are estimated variable-specifically, rather than locking the columns to present certain futures. Constants are not in the table, but they must be taken into account. Impossible variable-option states are eliminated during the process.

Although the method has been used primarily in technological foresighting, it also lends itself well to the construction of consumption scenarios, in which the demographic, economic and social dimensions (components) can be characterised by a certain number of possible states (hypotheses or configurations). A scenario thus becomes nothing more than a route, a combination bringing together a configuration for each component.

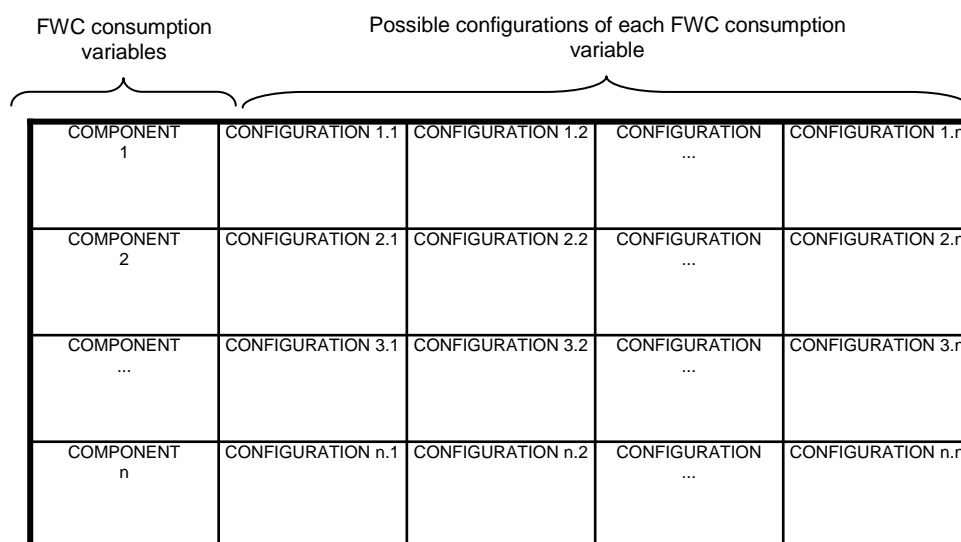


Chart Nr. 1: Morphol matrix scheme

OBJECTIVE OF THE MANUAL

To enable the Module 5 partners to create consumption scenarios for 2015 and 2025 for the FWC industries; on fibre, solid wood and bioenergy.

Morphological analysis aims to explore possible futures in a systematic way by studying all the combinations resulting from the breakdown of a system, in this case the system is shaped by key consumption variables in each FWC.

Phase 1. Preparing the MORPHOLOGICAL MATRIX

The matrix to be created consists of FWC consumption variables and of possible configurations assigned to each variable. Each partner should create the morphological matrix for the relevant product.

Chart Nr. 1. shows the structure of the matrix to be constructed on the FWC consumption variables and on possible configurations.

1./ Initially, the components must be as independent as possible. Too many components avoid a clear analysis; conversely, too few make for an oversimplified analysis. *In chart Nr.2 is represented an example component of furniture industry: "influencer of buying process"*

2./ A given scenario is characterised by the choice of a specific configuration for each of the components. In chart Nr.2 are represented four configurations for the component "influencer of buying process" of furniture industry; *configuration1: Influence of information based on visiting the shops configuration2: Mass media information influence configuration3: Influence of info obtained from friends, family members configuration4: Influence of information obtained through internet, blogs...*

3./ The morphol software accepts keywords as input.

4./ The configurations should be evaluated by each partner as experts of the industry, and assign to each one the weight of the probability of occurrence (in percentage) thinking of the referent futures' conditions and the years *.

5./ Data input to the software: put all the components and the configurations using keywords as the software requires; the probabilities assigned to each component should be put as well.

COMPONENT 1	CONFIGURATION 1.1	CONFIGURATION 1.2	CONFIGURATION ...	CONFIGURATION 1.n
COMPONENT 2	CONFIGURATION 2.1	CONFIGURATION 2.2	CONFIGURATION ...	CONFIGURATION 2.n
COMPONENT 3	CONFIGURATION 3.1	CONFIGURATION 3.2	CONFIGURATION 3.3	CONFIGURATION 3.4
Influencer of buying process 4	Influence of information based on visiting the shops 4.1	Mass media information influence 4.2	Influence of info obtained from friends, family members 4.3	Influence of information obtained through internet, blogs, etc 4.4

Chart Nr. 2. Morphological matrix with example

Phase 2: THE MORPHOL SOFTWARE

Morphol is a computer program that also manages the complexity of morphological analysis. Developed by Michel Godet, a prominent futurist in Europe, MORPHOL performs the standard morphological analysis, but it then reduces the total number of combinations based on user-defined exclusions (impossible combinations) and preferences (more likely combinations). It also provides an indicator of the probability of each scenario compared to the mean probability of all scenario sets based on the user-defined joint probability of each of the alternatives in the set.

Role of the software: The Morphol software is used to select the most probable combinations of the configuration in case of each component.

The program can be downloaded from the following website:

http://www.3ie.fr/lipsor/download/formulaire_es.php

- 1./ After opening the website there is a registration field appearing.
- 2./ Providing the required data and e-mail address is obligatory.
- 3./ The system automatically sends a link to the e-mail address provided in the registration form.
- 4./ Clicking on the link the following page is appearing:



- 5./ Click on the figure shown by the arrow and download the program
- 6./ Install the software.

The software is free of charge and should be actualized frequently.

Phase 3. RUNNING THE MORPHOL SOFTWARE

As it is explained above the input to the program should be provided in keywords with the evaluated probability assigned.

The output of the program is a list of configuration combinations in order of probability of occurring.

N°	Escenarios	Prob. Equi
1	2 2 2 3 2	21,87
2	2 2 2 3 3	21,35
3	2 2 2 2 2	20,34
4	2 2 2 2 3	19,86
5	3 2 2 3 2	16,86
6	3 2 2 3 3	16,46
7	3 2 2 2 2	15,68
8	3 2 2 2 3	15,31
9	2 2 1 3 2	13,61
10	2 2 1 3 3	13,28
11	2 2 3 3 2	13,12
12	2 2 3 3 3	12,81

Chart Nr. 3. Output of Morphol

The red arrow is showing the rank of the combination according to the probabilities.

The field shown by green arrow is showing the possible combinations of the configurations. Each number is representing the number of configuration in the matrix. E.g.: in case of the first scenario: the first number is indicating the second configuration of the first component. The second number is indicating the second configuration of the second component of the matrix, and so on... the 4th number is indicating the third configuration of the fourth component.

The blue arrow is showing the field of major probabilities.

The Chart Nr. 3. is showing the example output of the Morphol software.

The output of Morphol software could be a very high number of scenarios, so in case there are more than 5 components, it is useful to divide the matrix according to some criteria, and run separately the components.

Practical recommendations:

Please note that before the process of data input to the Morphol software, you should very carefully design the data, because the program does not allow modification during the data input process, so if you have committed an error and you wish to modify, the data input should be started again.

The output of Morphol software could be a very high number of scenarios, so in case there are more than 5 components, it is useful to divide the matrix according to some criteria, and run separately the components.

Phase 4. ANALYSING THE RESULTS

However, certain combinations and even certain families of combinations are unfeasible, e.g., incompatibility between configurations. The present phase therefore, consists of reducing the initial morphological space to a useful subspace, from which the relevant combinations can be examined.

The FAR (Field Anomaly Relaxation) technique is used to filter the unreal results.

1./ The FAR method is evaluating each combination that is provided as output by the Morphol software, and the unreal options should be deleted from the Morphol Matrix,

2./ As continuation the Morphol software should be run again, without the options dropped according to the evaluations of FAR analysis, this way providing more weight (probability) to the remaining configurations.

3./ There is obtained a new list that should be analysed, by selecting the most probable option and those which have sense.

For further info please check:

Rhyne, R. (1995) "Field Anomaly Relaxation: the arts of usage", *Futures*, Vol. 27 No 6, pp. 657-74

Phase 5. SCENARIO BUILDING

The scenarios will be built on the output results of the final run of Morphol software. Each partner should write scenarios on the results provided by the final morphol run. The question he selection of subspaces will give the FWC consumption scenario for each reference future.

*Very Important Question: The WP leader should make a decision on the following:

a./ Taking into consideration that EFORWOOD is using two reference futures, and there are two years to be examined: are we going to make the following structure of scenarios?:

	2015	2025
A1	Scenario 1	Scenario 2
B2	Scenario 3	Scenario 4

Which means four runs of the Morphol software with different probabilities assigned to each configuration, and we will define these four scenarios. Each partner should define 4 scenarios for each product.

There is an other option:

b./ This also means four runs of morphol software but the definition of 12 scenarios. Each partner should write 12 scenario for each product.

	2015	2025
A1	BAU (Sc 1)	BAU (Sc 2)
	Positive Rupture (Sc 3)	Positive Rupture (Sc 4)
	Negative Rupture (Sc 5)	Negative Rupture (Sc 6)
B2	BAU (Sc 7)	BAU (Sc 8)
	Positive Rupture (Sc 9)	Positive Rupture (Sc 10)
	Negative Rupture (Sc 11)	Negative Rupture (Sc 12)

Phase 6. REPRESENTING THE RESULTS

AIDIMA is suggesting the tools recommended by the experts of Pöyry: (Futures Pyramid, and Future Wheel) for representing the results.

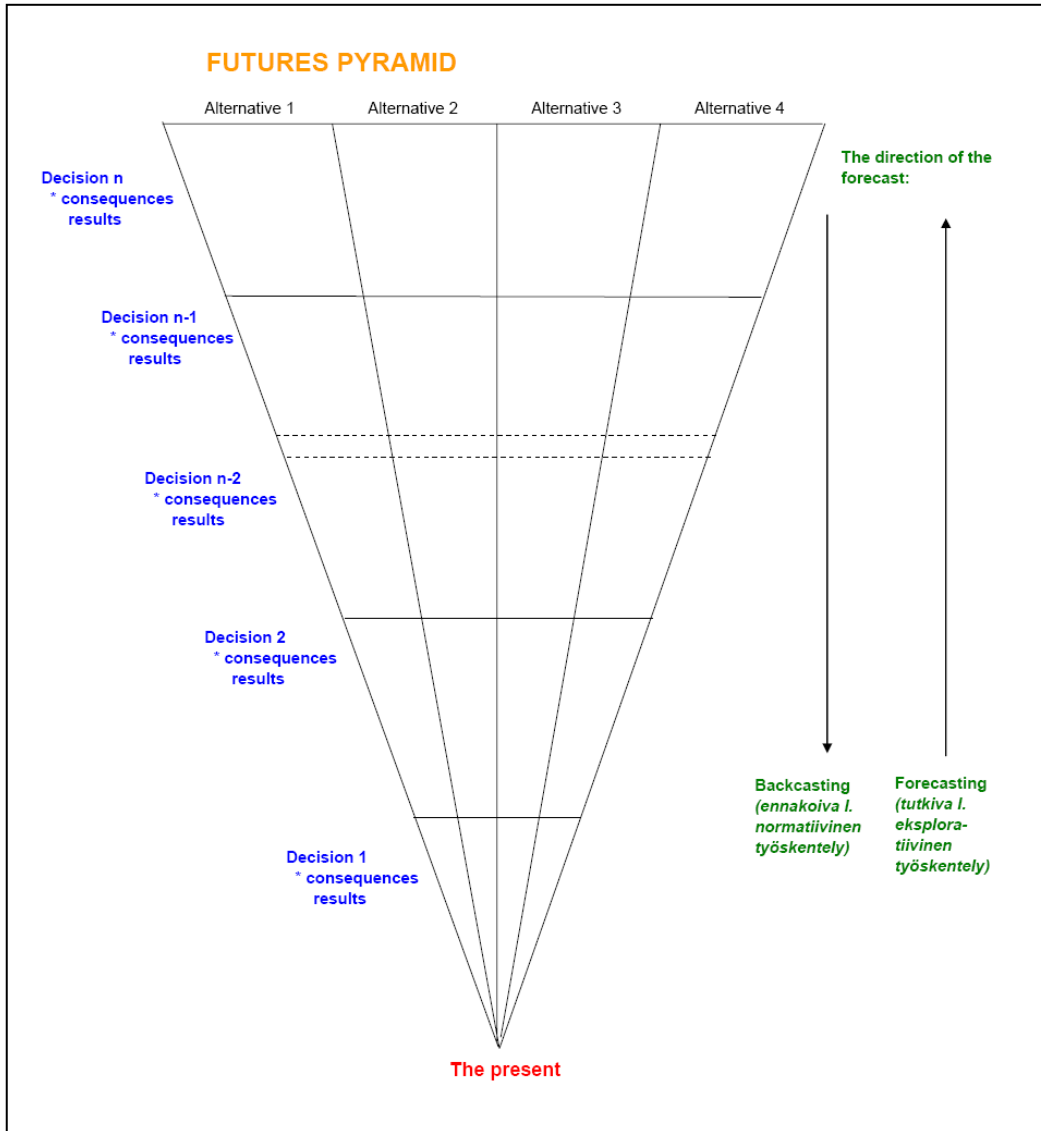


Chart Nr. 4: Futures Pyramide Source: Guidebook for futures research, Finland Futures Research Center, <http://www.tulevaisuus.fi/topi/>

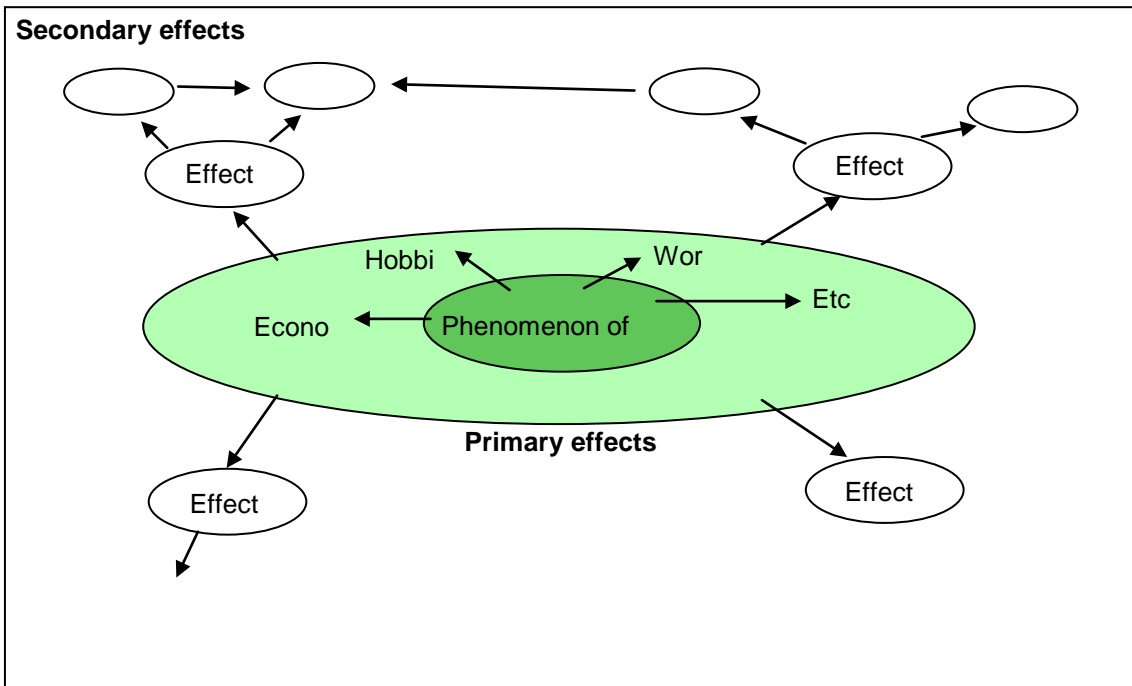


Chart Nr. 5. :Future Wheel, source: Guidebook for futures research, Finland Futures Research Center, <http://www.tulevaisuus.fi/topi/>