Step 2
Sustainability

Research on Occupation and Training Needs on Sustainable Manufacturing in Footwear

How to Implement Sustainable Manufacturing in Footwear - new occupational profile and training opportunities

Lifelong Learning Programme

Project number:
539823-LLP-1-2013-1-PT-LEONARDO-LMP

How to Implement Sustainable Manufacturing in Footwear - New Occupational Profile and Training Opportunities

Credits

Title
Research on Occupation and Training Needs on Sustainable Manufacturing in Footwear by STEP 2 SUSTAINABILITY project partnership

Coordination
CEC - Confédération Européenne de l´Industrie de la Chaussure

Layout and Editorial
Salto Alto CTCP criativo

Date
Outubro 2014

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1. Introduction

The Leonardo da Vinci project "Step to Sustainability", 539823-LLP-1-2013-1-PT-LEONARDO-LMP financed by the European Commission Lifelong Learning Programme aims at creating, designing, creating, developing and piloting a new occupation and qualification profile and correspondent training course, in order to address the shortage of VET skills in the field of sustainable manufacturing. The consortium includes four footwear technological centres with training competences – CTC (PT), INESCOP (ES), ISC-Germany, and IRCUO (SI)-, the Georghe Asachi Technological University (RO), Ars Sutoria School (IT), Czech Footwear/Leather Association, a Portuguese company Klaveness, and the European Confederation of the Footwear Company. The project started in November 2013 and it is expected to finalise in October 2016.

This report intends to present an overview of what represents sustainability for the European footwear sector with the aim of increasing awareness of the relevance of this topic in the business strategy. The footwear industry contributes to and is affected by the environmental degradation and social challenges that the society is now facing. Growing volumes contribute to water scarcity in production countries, an increased use of harmful chemicals and greenhouse gas emissions. At the same time, growing shortages of water and land pose great risks to the natural resources on which the industry relies upon. The encouraging news is that the industry has begun to offer constructive solutions. However, given the scale, complexity and urgency of the challenges we face, much more needs to be done. The demands on the industry for constant economic growth can be at odds with environmental and social sustainability. We need new approaches that will reconcile the demands of the market and the requirements of the planet and people.

The report comprises a first introduction about why sustainability should be part of our lives, providing examples of footwear stakeholders' initiatives in this field, and it is followed by a description on where companies themselves stand. The first project activity was therefore concentrated in approaching individual companies around Europe in order to know better what they understood by sustainability, how they considered it within their business strategy, what they were doing, and what more they needed in this field.

All the project partners wish to thank the companies that participated in the survey and permitted to develop this study.

2. About Sustainability

Sustainability is based on a simple principle: everything that we need for our survival and well-being depends, either directly or indirectly, on our natural environment. Therefore sustainability creates and maintains the conditions under which humans and nature can coexist in productive harmony, fulfilling social, economic and environmental requirements of present and future generations.

Sustainability has indeed a key role in our present and will deeply affect and improve our future. Applying sustainability to the industry world is also an important step to take. In October 2010, the European Commission underlined such message in its **Europe 2020 Flagship Industrial Policy Communication**, which notably sets out a new framework to promote the modernization of Europe's industrial base and the transition to a low carbon resource efficient economy; mobilizes the full range of EU and Member State policies to ensure that the EU remains an attractive place for business investment and job creation; outlines a more focused industrial innovation policy to promote the wide deployment of new key enabling and environmental technologies and addresses access to essential raw materials.

The need to deliver growth and jobs while doing more with less resources means that Europe has to make the most of its competitive advantages by exploiting the potential of its environmental goods and services industries and helping all the industry to become more sustainable. The footwear industry cannot stay out of this process and needs to keep up with the changes in society and in consumers' behaviours. Consumers are more and more conscious about their world surrounding and they wish to contribute to its sustainability. For them, it often represents an attitude that they would like to reflect in all the aspects of their lives, and therefore also in the products that they buy. This is one of the reasons why the market for green shoes is rapidly expanding, in sport, fashion and high performance footwear. The European footwear industry needs to embrace the opportunity of this new consumer awareness while manufacturing more competitive products. Sustainability provides an added value to our products, and represents a powerful way of differentiation.

Sustainability applied to the industry affects all the company working levels: the design and production departments, but also the managerial level. A multidisciplinary knowledge is needed in the company to develop a sustainable strategy. However, this knowledge does not currently exists, particularly at technical level. Furthermore, the footwear sector in Europe is constituted mainly by SMEs, which generally lack of qualified resources in this field, and do either not have the necessary resources for investing in training. Even if the circular economy is still far from the footwear industry because of the complexity of the product and processes, business should abandon the linear model and consider the integration of resource-efficient practices, eco- design and recycling in their business strategy. Specific tools should be developed to accompany business to exploit the added value of such resource-efficient models in the long term.

Sustainability is today a step towards competitiveness and can permit to hold a solid positioning in the global market, but the lack of education/training in the field is evident and provokes a big constrain for the implementation of a successfully strategy.

3. The footwear sector in the european union

In 2013 the footwear sector in the European Union directly employed about 289.000 people in 20.000 companies, The main European footwear producers still remain, by order, Italy, Spain, Portugal and Romania. The sector's turnover reached €24.251 million.

The footwear entrepreneurial landscape in Europe is characterized by the presence of small and medium enterprises, which manufacture handcrafted and high quality shoes. Latest Eurostat figures show than more than 96% of the footwear companies are SMEs, almost 74% of them employ 20 people. European footwear turnover raised by SMEs is over 65% of the total. The small dimension of the companies makes more difficult to properly address current and upcoming external factors and mid-term strategic developments. Many of them have therefore based their strategies on the external support of collective organisations and stakeholders, such as regional clusters, industrial associations and fairs. The supporting services most frequently used by SMEs include support to export and search for international partners, international communication and marketing campaigns, development of training programmes and research and innovation projects.

In terms of exports, the top five exporters in Europe are: Italy, Belgium, Germany, Netherlands and Spain. Of these countries some have a significant industrial activity such as Italy and Spain and others are specialized in importing and re-exporting. Furthermore, intra-European trade is the largest component of international footwear trade, representing almost one third of the worldwide exports.

Europe represents approximately 4% of the worldwide footwear production in quantity. Other continents play a predominant role in numbers of production on the international market. Asia is n° 1 producer with over 87% of world's share and South America is second with 5%.

However, statistics also illustrate how much European footwear is appreciated worldwide. From 2009 until 2013, footwear exports to third countries have increased by 31% in pairs and by 42% in value. Moreover, 9 out of the 15 most important countries in terms of export value are European. The average export price of the main European countries is significantly higher than the worldwide average. This data clearly reflects the high value of European footwear. This is not only due to production costs, significantly higher in EU than in the other big world market players, but also to the intrinsic value of the products manufactured in Europe, which are characterised by their high- quality, long design and manufacturing tradition. The high quality of European footwear manufacturing responds indeed to its creative design, the use of safe and well performing materials, and long lasting quality products manufactured in environmental and social sustainable conditions.

4. State of art in terms of sustainability in European footwear

Environmental sustainability is certainly becoming more and more present in the European footwear sector. What initially was considered as an external environmental regulation to comply with, meaning an obligation, is now becoming part of the DNA of some companies.

Companies, research and technological centers as well as educational centers realize that, by adapting good environmental practices in the manufacturing process and along the supply chain, they can improve their medium term competitiveness. As a result many initiatives have been developed by different categories of industry stakeholders. A few examples are mentioned below. , but almost every day we learn from a new best practice in the specialized press. Some of them are consequence of joint work of international consortiums with the assistance of the European Commission, others are the result of a company's efforts to proclaim their identity. They are and expect to become a source of inspiration for replication by other stakeholders in Europe, as well as for the development of other new initiatives.

The nature of these good practices differ, and they vary from training courses to sustainable processes, and innovative biodegradable products or materials, but they all have the same objective: to improve the environmental sustainability of European footwear companies.

INITIATIVE 1: Leather industry knowledge to improve sustainability in the industry	
Country:	Netherlands
Organisations:	Stahl Campus
Brief presentation:	Tanners and businesses in the automotive, fashion and furniture industry can undergo bespoke training as an additional service at Stahl Campus to improve their knowledge. At Stahl Campus they realized that there is a demand for information and expert knowledge across the whole industry in the field of sustainability. Therefore, they launched this initiative to share the professional knowledge about leather production and to permit, to the whole production chain, to benefit from this ad-hoc training. The Stahl Campus can be considered today as a vocational college underpinned by the principle of sustainability. The Campus regularly delivers guest lectures at the University of Northampton and at the technical vocational college in Lyon.
Objective:	The centre seeks to develop expertise throughout the leather production chain in order to improve sustainability in the industry.
Outcome:	Students gain a better insight into the leather production chain. Moreover they experience the benefits of sustainable practices and cooperation, such as innovation, cost savings and finished products with reduced impact on the environment.
Status of development:	Already started
Users:	Students and employees of well-known automotive and fashion brands
Website:	www.stahl.com

INITIATIVE 2: European project "Be Nature" - Disintegrable leather in composting conditions	
Country:	Portugal
Organisations:	CTCP, CTIC, Conforsyst, ANC, VEGA SPECIFY IF CATEGORY OF STAKEHOLDER, -SME OR OTHER- AND COUNTRY
Brief presentation:	The research project "Be Nature" was set up aiming at developing biodegradable and affordable leather, components and footwear. As part of the "Be Nature" project disintegrable leather in composting conditions to be incorporated in the shoes, such as in exterior leather, outer lining and insoles was developed. As proved by tests based on the method described in the ISO 20200:2004 standard, after 21 days in composting conditions this type of leather is completely disintegrated. This leather could be used in all types of day to day casual and fashion footwear used in normal conditions.
Objective:	The main objective is to develop biodegradable leather with minor impact to the environment to be introduced into the market, and also different types of footwear made with this eco-friendly leather.
Outcome:	• Disintegrable leather according to ISO 20200:2004 standard, which reveals good performance and resistance suitable for use in footwear; • Clean tanning process; • New composting process; • Expeditious method to measure the biodegradability.
Status of development:	The line of products, designated BioNature, is composed by a range of leather is already in the market by company tannery António Nunes de Carvalho, SA (ANC).
Users:	This new leather was developed for incorporation in footwear, but can also be used in several industries, such as: automotive, furniture, clothing, aviation.

INITIATIVE 3: Project "Newalk" - Chromium-free leather obtained through processes that prevent oxidation of chromium III to chromium VI during use	
Country:	Portugal
Organisations:	CTCP, CTIC, ISEP, ANC, Curtumes Aveneda, Dias Ruivo, Indinor SPECIFY CATEGORY OF STAKEHOLDER, -SME OR OTHER- AND COUNTRY
Brief presentation:	Much of the world's leather is tanned with chromium salts allowing finished leather to be suitable for various uses. Hexavalent chromium (Cr VI) is not intentionally used in the preparation of leather or production of leather goods, but can be formed by the oxidation of trivalent chromium (Cr III) used in the tanning process. European Union imposes restrictions on hexavalent chromium (Cr VI) in leather items that come into direct and repeated contact with the skin. Thus European tanneries are changing production techniques, incorporating more tests and using new and more sustainable processes.
Objective:	To introduce in the footwear industry an innovative eco-leather, obtained through processes that minimize the oxidation of chromium III to chromium VI during processing and use of leather and final products.
Outcome:	• Production of chromium tanned leather obtained through processes that prevent oxidation of chromium III to chromium VI; • Cleaner tanning process more sustainable and socially responsible; • The new material reveals good performance and resistance suitable for use in footwear manufacturing
Status of development:	The products are being commercialised by ANC, Curtumes Aveneda, Dias Ruivo and Indinor.
Users:	This new leather can be used in several industries, such as: footwear, automotive, furniture and clothing.
Website:	www.newalk.pt

INITIATIVE 4: Project "Newalk"- Nubuck 50% more resistant to light and metal-free	
Country:	Portugal
Organisations:	CTCP, CTIC, ISEP, Curtumes Aveneda SPECIFY CATEGORY OF STAKEHOLDER, -SME OR OTHER- AND COUNTRY
Brief presentation:	Chrome free nubuck leather used in footwear may be very sensitive to colour change by light, which limits their application. To answer this question the consortium of the Newalk research project developed new tanning and colouring processes to obtain value-added leathers nubuck 50% more resistant to light and metal-free.
Objective:	Introducing into the footwear industry an innovative and performing eco-material, obtained through cleaner production process.
Outcome:	• Metal-free Nubuck leather 50% more resistant to light; • Crust leathers more resistant to light; • Clean tanning and colouring process – sustainable and socially responsible (better to the workers); • The new material reveals good performance and resistance suitable for use in footwear industry.
Status of development:	European tanneries are changing production techniques to introduce in the market innovative leather. Leather resistance to light is a technical feature that adds value to the product. This new process was implemented by the European leather company Curtumes Aveneda.
Users:	This new leather can be used in several industries, such as: footwear, automotive, furniture and clothing.
Website:	www.newalk.pt

INITIATIVE 5: Eco-friendly leather tanned with Titanium			
Country:	Spain and France		
Organisations:	INESCOP, INCUSA, FLUCHOS, KICKERS, GASTON MILLE		
Brief presentation:	Titanium, as a tanning agent, produces products of appropriate quality for use in footwear production. Also, there are additional advantages to its use such as the fact that it is biocompatible, inert and it avoids possible allergic reactions. Another advantage of Titanium tanning is the reduction of Chromium in the wastewater of the tanning process and in the sludge of wastewater treatment plants, therefore improving the environmental impact of the process.		
Objective:	Introducing into the European market "Sanotan" leather obtained through a clean tanning process using titanium compounds, as well as different types of footwear made with said leather.		
Outcome:	• The adaptation of production line into a titanium tanning facility at INCUSA; • The production of titanium tanned leather; • The verification of compliance with technical specifications for footwear production process according to the requirements established by the European Ecolabel for footwear. • Avoidance of chromium compounds; • Reduction in electricity and reduction in gas consumption; • Reduction in chemical compound (other than chromium), reduction in water consumption and in CO2 emissions.		
Status of development:	The industrial scale production of titanium tanned leather is a worldwide innovation. The potential of transferability in very high. In fact, some European tanneries have expressed an interest in tanning hides and skins with this technology.		
Users:	These leathers not only have uses in the footwear industry, but also have a high potential for transferability to other sectors, such as the automotive and aviation, furniture and clothing industries.		
Website:	cordis.europa.eu http://cordis.europa.eu/news/rcn/36079_en.html	www.tileather.eu http://www.tileather.eu/	www.diarioinformacion.com http://www.diarioinformacion.com/elda/2013/03/06/apuesta-verde-inescop/1350480.html

INITIATIVE 6: Thermoplastic polyurethane (TPU) from renewable sources applied in footwear			
Country:	Spain and Italy		
Organisations:	INESCOP, LUBRIZOL, RESIMOL, INDUSTRIE CHIMIQUE FORESTALI, PEDRO GARCÍA. SPECIFY CATEGORY OF STAKEHOLDER, -SME OR OTHER- AND COUNTRY		
Brief presentation:	Plastics materials are commonly used in the footwear industry. Within this large family of materials, thermoplastic polyurethanes are often used to produce different footwear components (toe puffs, counters and soles). Thermoplastic polyurethanes are linear polymers formed by the polymerization reaction of two basic components: di-isocyanates and polyols. So far, the chemical industry has been using fossil resources, especially oil, to produce TPUs. Face with this situation, the implementation of technology innovations in production processes aimed to obtain value-added products is seen as a solution for companies to boost their competitiveness and this way ensure their sustainability. Recently, a new process has been successfully developed through which it is possible to achieve polyol synthesis from renewable sources used as raw material, improving the environmental performance of such products.		
Objective:	Introducing into the European footwear market an innovative thermoplastic material (Bio TPU) as a fuel substitute obtained from renewable sources with a bio-based content between 30% and 9% and with similar properties to those products obtained from fossil resources.		
Outcome:	• Reduction in greenhouse gas emissions, due to the fact that EcoTPU shows a considerably reduced carbon footprint impact; • Reduction in non-renewable resources consumption; • To considerably reduce the carbon footprint of the final product, thus improving the competitiveness of European footwear companies; • It is feasible to obtain TPU from renewable sources. The properties of this new family of environmental-friendly materials are comparable to those of conventional TPUs and in some cases are even better. • The results of the control tests carried out prove that these new materials meet the quality standards required for footwear manufacturing.		
Status of development:	Different environmental-friendly TPUs are currently available on the market, as well as different components for footwear manufacturing (soles, counters and toe puffs) made of these raw materials.		
Users:	In addition to the footwear industry, this new family of environmental-friendly TPUs can be used by other industries (automotive, furniture, clothing, etc.).		
Website:	www.ecotpu.eu http://www.ecotpu.eu/default.aspx	www.ecotpu.eu *(download pdf)* http://www.ecotpu.eu/Public%20deliverables/D5%204_LAYMAN'S%20REPORT_SPANISH%20VERSION.pdf	cordis.europa.eu http://cordis.europa.eu/news/rcn/36082_en.html

INITIATIVE 7: Recycled soles		
Country:	Italy	
Organisations:	Finproject	
Brief presentation:	Production of Eva soles from re-using expandable and cross-linking polyolefin material from industrial production waste and molded products	
Objective:	Waste recovery	
Outcome:	A sole which is recycled	
Status of development:	Done through special equipment that facilitate the blending of inhomogeneous components.	
Users:	Shoe producers	
Website:	www.finproject.com	www.xlextralight.com

INITIATIVE 8: NATURALISTA project	
Country:	Spain
Organisations:	El Naturalista (Company in Navarra, Spain)
Brief presentation:	The project wanted to reuse post-used shoes and footwear waste, and to use them in new products by means of a mechanical treatment of footwear waste. The main difficulties of footwear recycling is the need to separate the different original components. This initiative aimed at reusing footwear as a whole, without the need to separate its components, and to add it to higher value added products within the footwear, sports and road safety sectors.
Objective:	The main objective was to analyse if marketable products could be produced from waste polymeric material, thus diverting waste from landfill, and reducing the need for production of new polymers.
Outcome:	A full analysis of the results it is not yet available, but the project is regarded as a success as it has demonstrated public acceptance of recycled materials in shoes. More than 12,000 pairs of shoes with recycled insoles have been sold.
Status of development:	Project ended in August 2012
Users:	Consumers
Website:	www.eco-naturalista.eu

INITIATIVE 9: CO2Shoe project -Enhance eco-design: The footwear sector carbon footprint	
Country:	Spain, Italy, Portugal and Poland.
Organisations:	Spanish Footwear Technological Institute (INESCOP), Portuguese Footwear technological Centre (CTCP), European Confederation of the Footwear Industry (CEC), CGS Group (Italy), Spanish Footwear Association (FICE), Institute of Leather Industry (Cracow).
Brief presentation:	The calculation of the carbon footprint remains a challenge for many industrial sectors that often include a wide range of components or stages throughout their manufacturing process and during the product lifecycle. In addition, there is a broad spectrum of methodologies in use and under development for calculating the carbon footprint, which accounts for the large differences observed between the results obtained according to the methodology employed. Faced with this situation, the CO2Shoe project was launched with the aim of establishing uniform criteria for the calculation of the carbon footprint of a pair of shoes, considering the greenhouse gas emissions released throughout the manufacturing process.
Objective:	To reduce the environmental impacts derived from footwear manufacturing in terms of climate change. The project will develop and facilitate the use of a carbon footprint tool that calculates the Greenhouse gas emissions produced by each pair of shoes.
Outcome:	A specific carbon footprint calculation tool for the manufacturing of footwear.
Status of development:	The tool has been developed and it is being tested in the different categories of footwear.
Users:	Footwear companies
Website:	www.co2shoe.eu

INITIATIVE 10: Higg Index	
Country:	United States of America
Organisations:	Sustainable Apparel Coalition (SAC)
Brief presentation:	The Higg Index is an apparel and footwear industry self-assessment standard for assessing environmental and social sustainability throughout the supply chain. Launched in 2012, it was developed by the Sustainable Apparel Coalition, a non-profit organization founded by a group of fashion companies, the United States government Environmental Protection Agency, and other non-profit entities.
Objective:	The Higg Index 2.0 is a learning tool for both small and large companies to help them standardize how they measure and evaluate environmental performance of apparel and / or footwear products across the supply chain at the brand, product, and facility levels. It is: • a self-assessment tool that enables rapid learning through identification of environmental sustainability hot spots and improvement opportunities; • a starting point of engagement, education, and collaboration among stakeholders in advance of more rigorous assessment efforts. The metrics created Higg Index are limited to a company's internal use for the evaluation and improvement of environmental performance. Plans for a future version include the creation of a scoring scale designed to communicate a product's sustainability impact to consumers and other stakeholders. Retail activities are not included in The Higg Index 2.0, but will be considered for future releases.
Outcome:	A standard tool to measure and evaluate environmental and social/ labor performance of apparel, including footwear products, across the supply chain at the brand, product, and facility levels.
Status of development:	Higg Index 1.0: released on June 26, 2012 (for apparel industry) Higg Index 2.0: released on December 11, 2013 According to the Sustainable Apparel Coalition, with the release of the Higg Index 2.0, the Index has reached a mature phase – the Higg Index 2.0 represents a pivot point where the SAC will now focus its resources on enabling widespread adoption of the Index instead of making wholesale changes to the Index. That said, the index will always evolve and improve over time. Below are several areas that are being considered for development, - note that there is no timetable for delivering these improvements • ***Product Assessment:*** SAC will be evaluating the product assessment needs of the various users in the industry (e.g. designer, sourcing) and what tools to develop to help them make more sustainable choices. SAC says that they intend to take a more holistic view of developing further product assessment tools. The Rapid Design Module – Beta represents an opportunity for the SAC to continue to test their hypotheses on how to provide better sustainability information to those making critical decisions. • ***Assurance of responses:*** SAC is considering developing a Higg Index assurance process/protocol to enable organizations to have confidence in others' assessment responses. • ***Metrics:*** Expand indicator-based Index to include quantitative data and metrics: In addition to asking "yes/no" questions, ask for data to support quantitative metrics that will help provide a more accurate picture of environmental performance (e.g. energy use data).

INITIATIVE 10: Higg Index	
Status of development:	• ***Scoring:*** Improve scoring through a systematic review of scoring principles, their application to the Index and the data supporting point allocation. Improve packaging scoring through the use of the Materials Sustainability Index (MSI). • ***Section weighting:*** Improve SAC suggested weights through a panel approach involving a larger group of stakeholders and a tailored multi-criteria analysis based approach to elicit weights. Align on one set of weights to enable consistent benchmarking and product comparison for business decisions and consumer-facing communications. • ***Standards and certification equivalencies:*** Define and incorporate Index "equivalencies": In order to simplify the usability of the Index and recognize investments that brands, facilities, and suppliers have made in key certifications or standards, SAC plans to evaluate these and determine where Index questions can be automatically filled in based on achievement of a certain certification or standard. For example, the Index may have a checkbox asking for a specific certification, and if checked it would auto-populate the corresponding questions in the Index. • ***Materials Sustainability Index (MSI):*** Refine governance process and increase community engagement to improve the MSI scores and framework, and expand the database as more data, information and methodologies become available and/or evolve.
Users:	According to SAC, the Higg Index has been used by hundreds of organizations, both SAC Members and others.
Website:	www.apparelcoalition.org http://www.apparelcoalition.org/higgindex

INITIATIVE 11: Leather industry knowledge to improve sustainability in the industry			
Country:	Slovenia		
Organisations:	Alpina d.o.o. + Studio Miklavc		
Brief presentation:	Alpina shoe factory is world biggest cross-ski county boot producer with more than 30% of world market share in this field. They produce more than 500.000 pairs of such boots per year. Because their main market are Scandinavian countries, which are very close connected with nature and ecology they would like to develop first almost totally biodegradable cross ski-country boot collection.		
Objective:	Clever design, innovative materials, and suitable production technology make the PROMISE shoe almost totally biodegradable while also being waterproof and breathable. Its universal shape means it can be worn by men, women, or children, offering them exceptional comfort thanks to its ability to adapt to a multitude of foot shapes.		
Outcome:	3 different models for classic style for cross-ski country running are available on the market at this moment.		
Status of development:	The collection of 3 different boots was developed and put on the market during the year 2010. The collection gets also one of the most important European industrial design awards - RED DOT. Its quality, ecological compatibility, and emotional content are the reason why PROMISE is an award-winning.		
Users:	All recreational cross ski runners who want to enjoy in sport activities with biodegradable cross-ski country boots.		
Website:	www.alpina.si http://www.alpina.si/eng	www.alpina.si http://www.alpina.si/pages/awards/20	www.miklavc.si http://www.miklavc.si/alpinapromise.html

INITIATIVE 12: ShoeLAW Project	
Country:	Spain, Italy, Portugal, Greece and Slovenia.
Organisations:	Spanish Footwear Technological Institute (INESCOP), ECOMEDIUM Sistemas S.L. (ES), Industrial development centre for leather and footwear industry (IRCUO - SI), C.G.S.-C.G.S di Coluccia Michele & C. s.a.s. (IT), Technology & Design Center (ELKEDE -GR), Portuguese Footwear technological Centre (CTCP), Spanish Footwear Association (FICE), Fundación Comunidad Valenciana- Región Europea (FCVRE -ES)
Brief presentation:	European Small and Medium Sized companies operate within a "business culture" framework that did not consider planning environmental activities as a strategic variable for their medium and long term development. The Project created an instrument for obtaining information about the environmental legislation that is applicable in other export destination countries. It developed an e-platform for environmental self-diagnosis of footwear companies in order to: • Promote the effective application and execution of environmental legislation among European footwear companies. • Improve the environmental situation of European footwear companies. This first legislative database for the footwear industry was created on a requirement-structure basis and a company can be informed about the requirements applicable in another project's partner country and on a European scale, in a precise and simple way.
Objective:	The main objective of the SHOELAW Project was to develop an e-platform for environmental self-diagnosis aimed at footwear companies in five European countries: Spain, Italy, Portugal, Greece and Slovenia.
Outcome:	The project provided the European Union with the first legislative database available for footwear industries.
Status of development:	The project was concluded in June 2012.
Users:	European footwear companies.
Website:	www.shoelaw.eu

5. Methodology used in the research: the survey

In the framework of the project objective, it was essential to elaborate a preliminary study to collect information about what footwear companies knew and were doing in terms of environmental sustainability in their businesses. For that purpose, an ad-hoc survey for collecting reliable data was elaborated and distributed among companies of the seven countries of the project's partners, i.e. Czech Republic, Germany, Italy, Portugal, Romania, Slovenia and Spain.

The information gathered from this survey permitted to obtain a picture of what were the companies' current concerns and priorities, and what competences and skills would have to be included in the definition of the "occupational profile in sustainability in the footwear sector", a future employee able to facilitate the adoption of sustainable practices in the company.

The occupation profile will have to be transversal and recognized in all European countries, and therefore a deep knowledge about the actual situation in different European countries was considered crucial. The survey should allow to compare the different situations in each European country and to underline the common points.

The questions of the survey were thoroughly elaborated by all the project partners, who distributed them among their national companies. In the majority of the cases, partners physically met with the companies in order to facilitate the understanding and relevance of the necessary information required. A first round of collection of replies was done in March, April and May 2014. However, when analysing the replies collected, partners identified that a few questions required deeper development or clarification in order to be sure that all understood the same meaning, and that there was no room for misinterpretation.

The questions that required further development and/or simplification concerned information on:

– Number of pairs produced
– Classification of type of shoes
– Aspects that could influence consumers to buy

The survey was also distributed to companies in footwear fairs, like Expo Riva Schuh in Riva del Garda, and GDS in Frankfurt. Furthermore, it was uploaded on the project website www.step2sustainability.eu in nine European languages: Czech, English, French, German, Italian, Portuguese, Romanian, Slovenian and Spanish.

The questionnaire was organized in open questions and multiple choices in order to permit companies to reply to the survey in maximum 15 minutes. Companies had the possibility to leave questions in blank if they were not able or willing to provide such information.

The questions were organized under three sections related to specific areas of interest:

1. General Information
This section was very specific about the entity in order to understand the size and characteristics of the company that was taking part in the survey. Information like contact details, number of employees, type and pairs of shoes produced, average price, etc. were asked. For the purpose of the research, this type of information was considered very useful to map the potential differences in terms of sustainability among companies of different size and origin. Moreover, in order to understand her priorities, the company was asked about what external topic could become a threat or an opportunity for their business.

2. Innovation Needs
The section had the objective of obtaining information about the innovation needs of the companies. In particular questions such as the fields in which research should concentrate on innovation were asked. But also the investments in technologies, the main technologies that were already in use in the industry, the strategy in terms of innovation, the variables that influenced consumers to buy, the shortage of skilled workers etc. Through these questions an analysis of the technological and innovative side of the industry was possible.

3. Training Needs
The questions aimed at understanding the situation in each company concerning training needs and the areas that could benefit more from training as well as the actual lack of skills and competences.

Both versions of the survey can be found as annexes at the end of this report.

6. Results

This section compiles the data extracted from the replies received to the survey. Taking into account that there were no major differences in the replies received between the first and second round- after clarifying a few questions -, the results of both rounds have been added together.

The analysis of the replies allowed to develop the necessary knowledge on the training needs that the companies needed in terms of sustainable manufacturing of footwear, and be able to develop the respective profile.

The replies to the questionnaires came from many different countries in Europe:

• First round: 44 completed questionnaires received from Czech Republic (4), Italy (11), Germany (8), Norway (1), Poland (2), Portugal (4), Romania (7), Slovenia (1), Spain (5) and Sweden (1).

• Second round with adjustments in certain questions: 38 completed questionnaires received from Czech Republic (15), Spain (7), Slovenia (4), Romania (4), Germany (3), Italy (2), Macedonia (1), Sweden (1) and France (1).
In total 82 completed questionnaires were received from the following EU countries:

- Czech Republic (19)
- Italy (13)
- Spain (12)
- Romania (11)
- Germany (11)
- Slovenia (4)
- Portugal (4)
- Poland (2)
- Sweden (2)
- Former Yugoslav Republic of Macedonia (1)
- France (1)
- Norway (1)
- Slovenia (1)

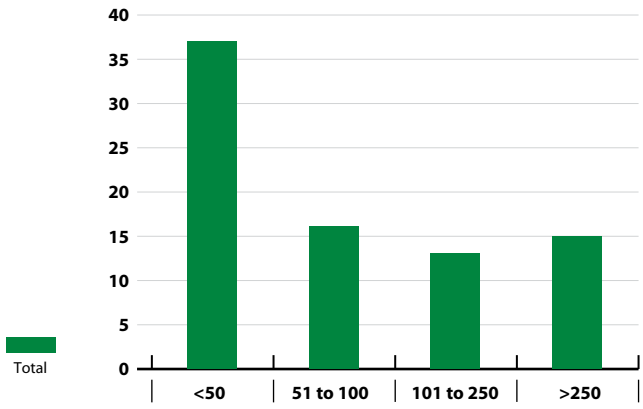
FIRST SECTION OF THE SURVEY: GENERAL INFORMATION ABOUT THE COMPANIES

For privacy reasons, the contact details of the companies were not shared among the partners nor will be published in this report. Therefore only the data that permits to understand the profile of companies participating in the survey will be presented.

Size

The first important information that the survey enquired was the size of the footwear companies and thus the number of employees they had in 2013. As it can be observed in the Chart 1, the majority of companies represented in the survey are small enterprises with less than 50 employees. Less represented companies have between 51 and 100 employees or more than 250 employees.

Chart 1. Number of employees in 2013

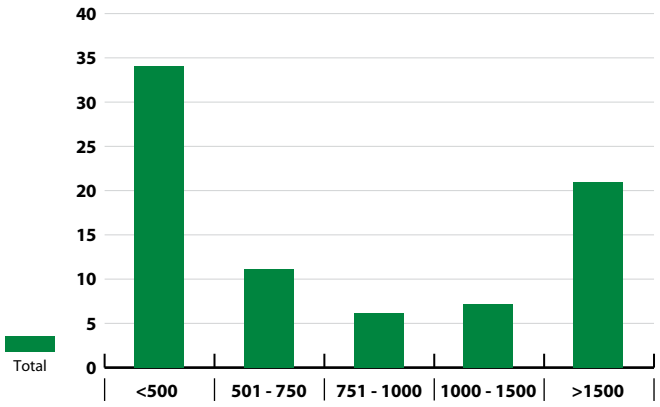


Furthermore, out of 82 companies 37 have declared to have a nominee with specific responsibilities for sustainability topics. This information provides an important signal of the relevance that sustainability has currently in the footwear sector.

Production

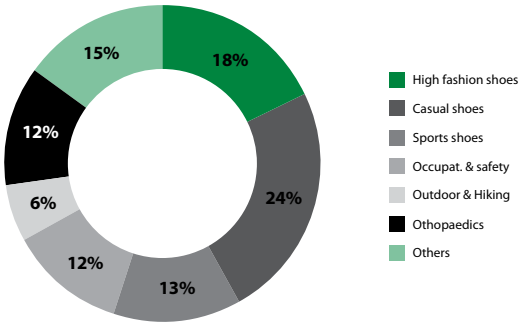
The production, in line with the size of the companies, is either very reduced, less than 500 pairs, or done in big quantities, more than 1.500 pairs per day (Chart 2).

Chart 2. Number of pairs produced in 2013 (pairs/day)



Going into details in terms of type of shoes produced, disregarding the target group and looking at the functionality, the majority of companies produce casual shoes (24%), followed by high fashion shoes (18%). In minor quantity but still with an important ratio are also the categories of others shoes (15%) and sports shoes (13%) (Chart 4).

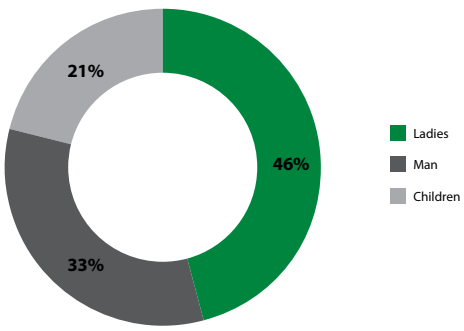
Chart 4. Type of shoes produced



Type of shoes produced

Concerning the type of shoes produced two levels of observation are possible: in terms of target group and of type of shoes produced. In the first case the majority of companies, 46%, produce shoes for women followed by man, 33%, and children, 21% (Chart 3).

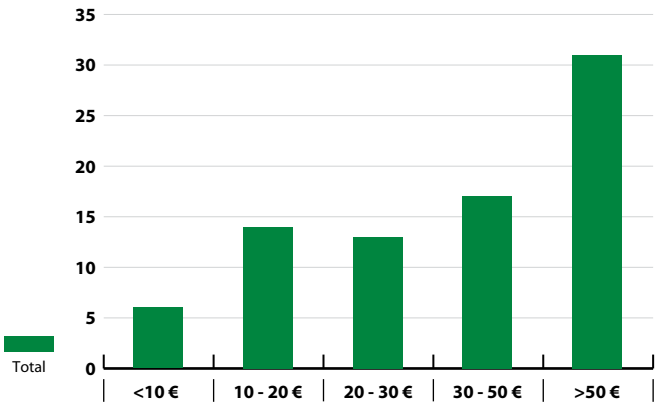
Chart 3. Shoes produced in terms of target group



Average selling price

The average selling price or factory price is mostly high, more than 50 Euros, Europe registers in fact the highest prices among all the continents in the world. Some companies also apply prices in a range between 30 and 50 Euros and between 10 and 20 Euros (Chart 5).

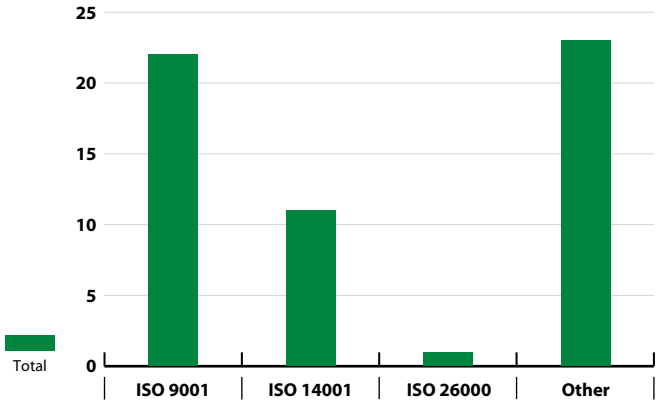
Chart 5. Average price to retail



Footwear standards

Companies were also inquired as regards their use and implementation of recognized footwear standards. As it can be observed in the Chart 6 the majority of companies comply with their own quality controls and with ISO 9001. ISO 26000 is by far the less common standard in use in Europe.

Chart 6. Compliance with standards



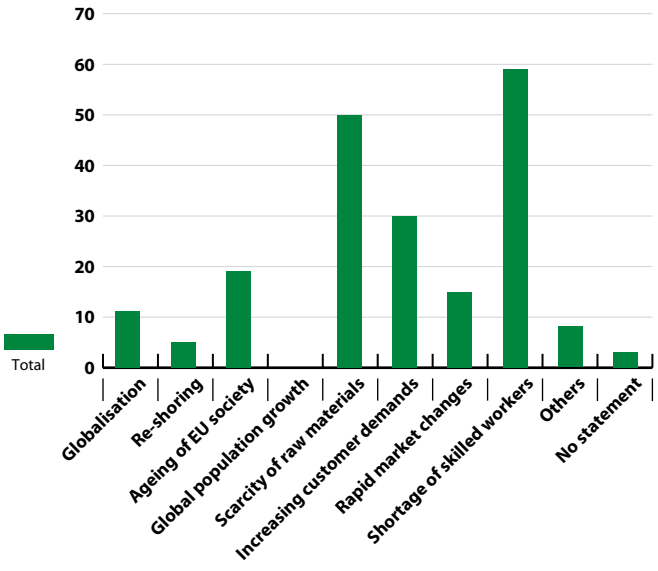
Threats and opportunities in global trends

With a view to understand whether the global trends and external factors influencing companies today could represent a threat or an opportunity by 2020, companies were requested to indicate their opinion on various global trends. Multiple answers were possible.

Chart 7 illustrates the global trends that were considered as threats. The main threat or problem indicated by the majority of the companies was the **shortage of skilled workers.** This is in fact a serious problem in Europe that must be addressed by all categories of footwear stakeholders.

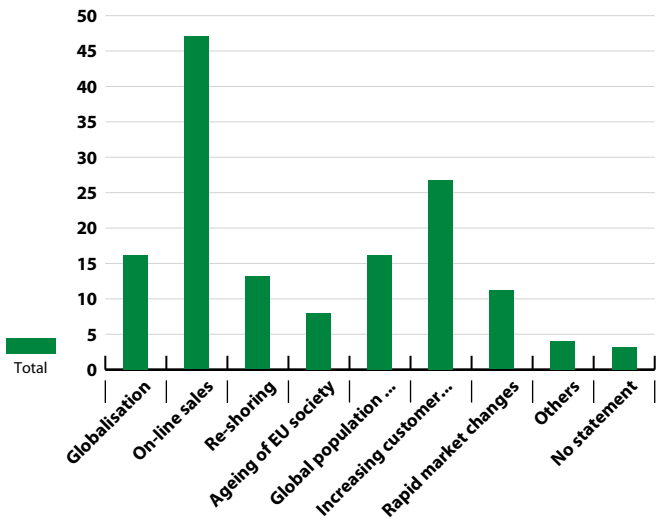
The shortage of skilled workers was followed by **the scarcity of raw materials,** another important threat for the footwear companies, and therefore the importance of investing in the research of innovative and green materials. Far from these two choices, **the constantly increasing customer demands** was also considered as a threat as well as **the ageing of European society.**

Chart 7. Threats in global trends



However some companies considered that the same global trends would be an opportunity for the footwear sector by 2020 (Chart 8). In this case, the majority of companies indicated **the on-line sales** as the main opportunity as it was a new low cost sales channel that provided companies with a double opportunity: to sell their products to different type of customers all around the world, and to collect useful data for their business about customers, like the gender, the foot size, etc. but also their preferences in terms of colours, models, etc. as well as on their buying behaviour. All this information could help the company to orientate its future strategy and plan its production moreover than identifying possible trends in the consumers' behaviour evolution.
The second trend identified as an opportunity was **the constantly increasing customer demands,** followed by the **globalisation** and **the global population growth.**

Chart 8. Opportunities in global trends



As already mentioned, some companies considered that a global trend could represent at the same time a problem and an opportunity. This resulted to be the case of **the constantly increasing customer demands,** particularly in terms of customisation, green production, social and environmental standards, etc.. The companies must take the opportunity facilitated by this external factor, and listen to the needs and requests of the customers, among others for green products. At the same time, they need help in addressing this request and overcome the lack of resources. This is what the project "Step to Sustainability" intends to provide assistance to companies in order that they meet consumer needs and expectations.

SECOND SECTION OF THE SURVEY: INNOVATION NEEDS

This section of the survey had the objective of understanding more in detail the needs and priorities given to innovation by the companies.

Useful innovation for the companies

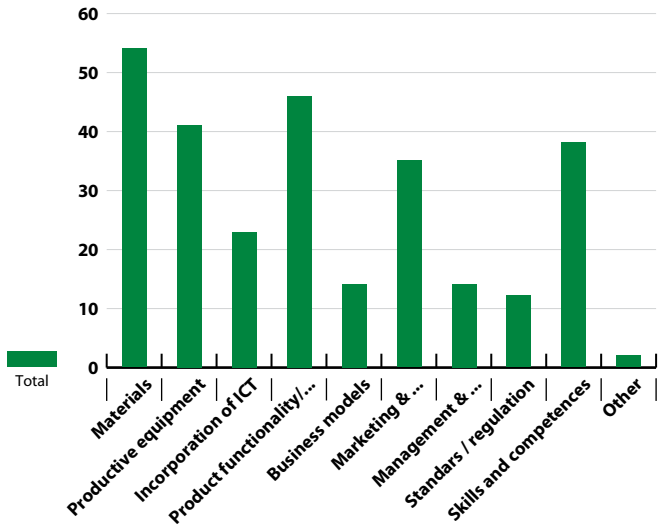
The first question referred to the fields on which companies would like to concentrate research and to the type of innovation that would be particularly useful for the company. Again here companies had a multiple choice question to permit them to choose more than one field.

The Chart 9 indicates the main results of the survey concerning this question. The most important field was considered to be **the technology in materials,** followed by, in order of relevance: **product functionality and design, technologies in protective equipment, skills and competences and marketing & commercialisation.** Footwear companies already face the problem of the scarcity of raw materials as showed in the Chart 7, and therefore innovation and research on new materials remain crucial. On this topic, it is interesting to notice that 52 out of 82 companies have invested in technology materials in the past five years and mainly in 3D rapid prototyping, CAD system, modernisation of machinery and in direct soling, sewing, laser cut and sole fitting machines as well as in computerized stitching and ERP systems.

Concerning the product functionality and design, as already mentioned, consumers are today more and more demanding and they wish to reflect their way of thinking and their lifestyle in the shoes they wear. Their pair of shoes have to respond to all these elements and incorporate functionality, style, design, fashion and sustainability.

Skills and competences occupy the third position. Such outcome is coherent with the shortage of skilled workers that was indicated as the main threat of the footwear industry in the section "General Information". It is clear that the companies need the collaboration of the research or/ and educational centres in order to train workers because SMEs do not normally have the resources to do it internally. Moreover, training would have to be adequate with the progress of the technologies in the industry.

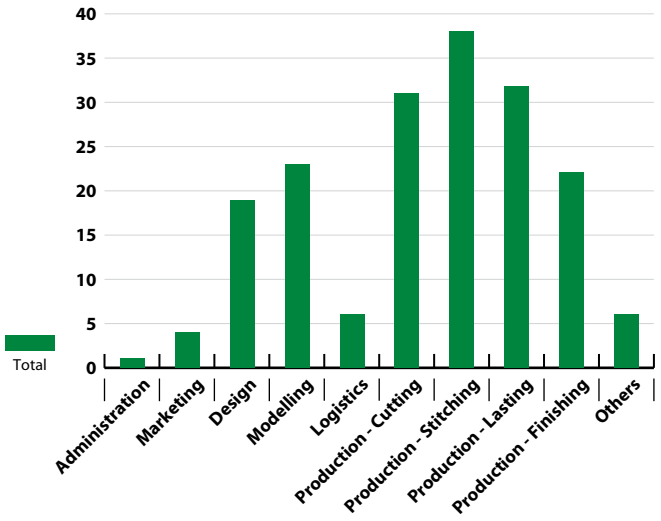
Chart 9. Research & Innovation



Shortage of skilled workers

As regards the shortage of skilled workers, the companies had to indicate in which areas they were more affected by this problem. Multiple choices were possible. The chart 10 displays the replies of the companies and it clearly appears that the production-related areas are the ones with more problems linked to the lack of skilled workers. A slight lower impact has the design and modelling areas. However, what is interesting to notice is that, in general, all the technical profiles lack skilled workers.

Chart 10. Shortage of skilled workers



Factors that influence consumers to buy

In order to understand the aspects that influence consumers to buy, a list of elements was proposed in the survey and the companies were asked to grade the influence. For each factor they could choose between:

1. Low influence/motivation to buy
2. High influence/motivation to buy
3. Not applicable/Do not know.

The elements proposed were the following:

- Fair economic practices
- Local production
- Green production
- Price
- Healthy and wellness
- High comfort
- Brand
- Fashion
- Durability
- Origin of the product
- Other: companies could indicate other factors that they considered important

In order of preference, the most relevant factors in the "customer buying process" were considered to be:

1. Price
2. High comfort
3. Brand
4. Fashion
5. Healthy and Wellness
6. Durability

7. Local Production

According to footwear companies: price, high comfort and brand seem to be the main aspects that influence consumers to buy. Certainly in Europe these three elements are very important for the more and more demanding customers, which look for quality shoes with a high level of comfort and great value for money. Moreover, they recognize themselves and their lifestyle in the brand's philosophy and values.

Fashion, health and wellness, durability and local production are the following aspects that reflects the new customer, who looks for fashionable products and wants to always up to date on the latest trends. Consumers pay more and more attention to the products in terms of health and wellness. There are particularly new niche markets among old people, some with health problems, and they represent an opportunity to the companies in terms of specialization. Companies start also to realise that consumers also appreciate companies that respect the environment, and care about durability and local production, a company that has a strong connection with the territory and that produces in a sustainable way.

Strategy in terms of sustainability

The survey enquired companies about whether they had or not a strategy in terms of sustainability in order to assess their level of interest in the subject. Companies could choose from four answers:

1. My company invests money in order to improve energy efficiency, to save resource, and become more environmentally friendly and more sustainable

2. We do not have a specific strategy but we would like to learn more about possible measures and the related expenses/savings

3. This is not a topic of interest for my company

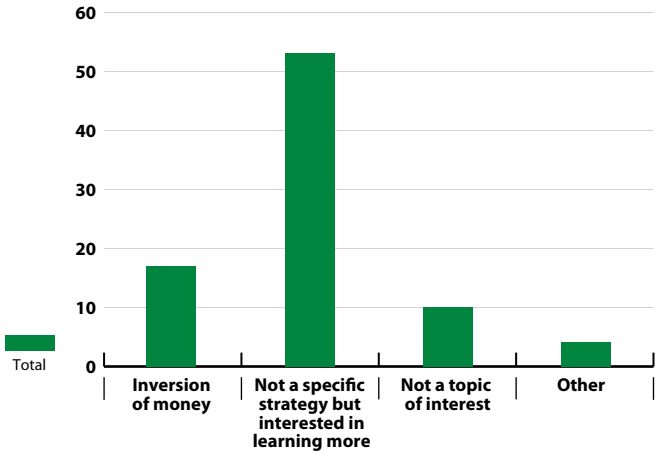
4. Other: possibility for companies to indicate other situations

The results of the survey, Chart 11, illustrate that the majority of companies do not have a specific strategy in terms of sustainability, but they would be interested in learning more.

The main problem for the companies in this sense is the lack of resources. The companies are interested in learning more about way of saving money and resources, thus they would welcome initiatives intended to assist them in this process.

Many companies also replied that they had invested money to improve energy efficiency, to save resources, and to become more environmentally friendly and sustainable. The biggest companies that participated in the survey gave this reply, which means that in case of availability of resources, companies do consider sustainability as an important element to include in their business strategy, and they consider it as an investment for the future.

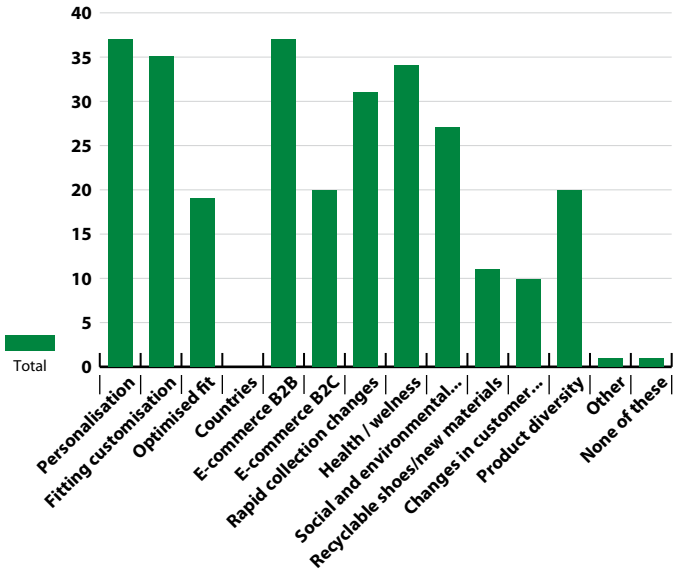
Chart 11. Strategy in terms of sustainability



Confrontation with market demands

A multiple choice question on this topic provided the results displayed in the chart 12. The main market demands that companies have to face resulted to be personalisation, which included individualisation and customer-specific modification of the shoe style i.e. colour, logo, personalised embroidery, etc.., and e-commerce Business to Business (B2B). Immediately after, followed fitting customisation and health and wellness. Social and environmental standards also covered a remarkable position together with rapid collection changes. The markets are in continuous evolution and these demands are the day to day challenges that footwear companies have to face. In this process, the consumer has an active and central role that the companies cannot ignore and have to deal with in order to be competitive.

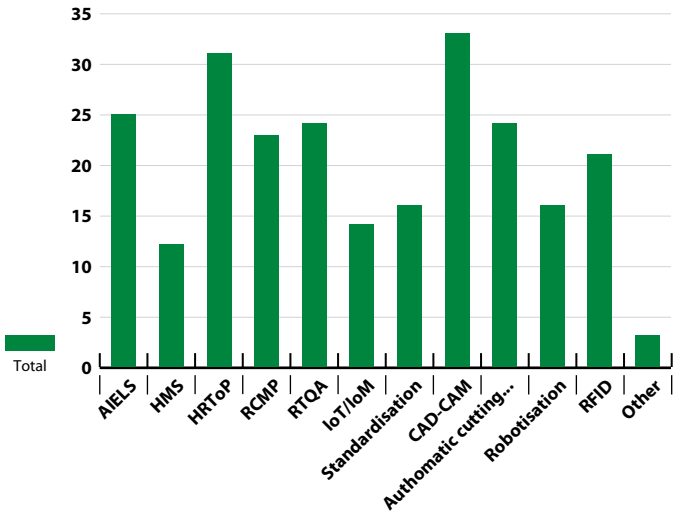
Chart 12. Market demands



Key technologies

Footwear companies were asked about the key technologies that they thought could strengthen their competitiveness. According to the results in Chart 13, the main technologies were the CAD-CAM and the highly responsive technologies for on-demand production (HRToP). Very important were also the advanced in-house and external logistics solutions (AIELS) the online real-time quality assurance (RTQA), the automatic cutting systems and the resource-conscious machines and processes (RCMP).

Chart 13. Key technologies



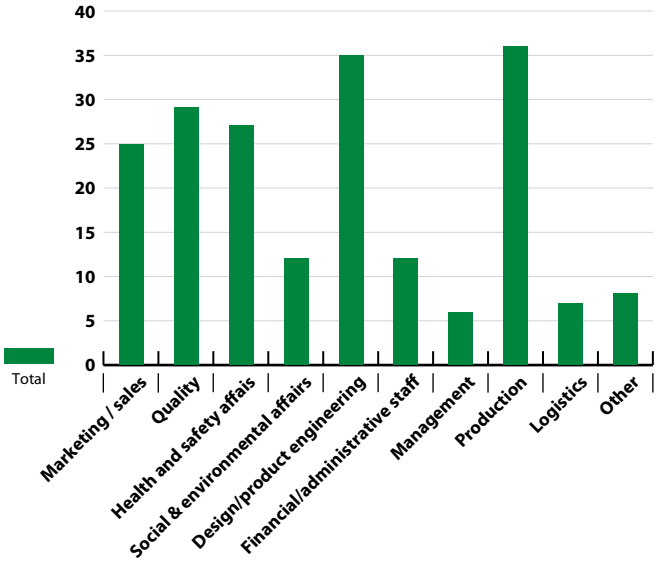
THIRD SECTION OF THE SURVEY: TRAINING NEEDS

The section was conceived in order to assess the training needs of the footwear companies, and to have a clear scenario of the activities already in place in terms of training, as well as what could be done to improve the actual situation.

Investments in training

68 companies out of 82 replied that they had invested in staff training over the past five years. Chart 14 illustrates the main areas in which training investment had been done, which are production in first position immediately followed by design and product engineering. A relevant position is also held by the quality, health and safety affairs and marketing and sales department.

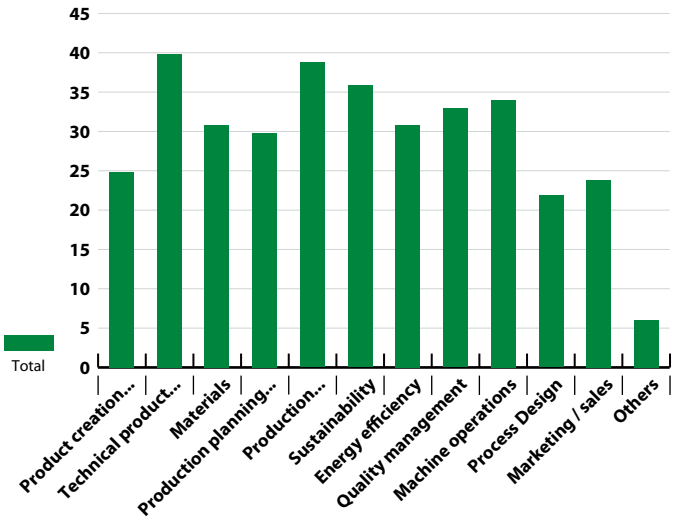
Chart 14. Investments in training



Areas that could benefit from training

After having an overview about the areas in which companies had invested in training, they were asked in which training areas they would like to invest. Chart 15 shows that technical product design, product optimisation and sustainability were the main areas that should benefit from training according to companies. This is an important indicator of the needs that companies have and of their priorities if they had the adequate resources. Also machine operations, quality management and energy efficiency areas registered important results, and confirmed that training in the field related with sustainability was needed.

Chart 15. Areas that could benefit from training

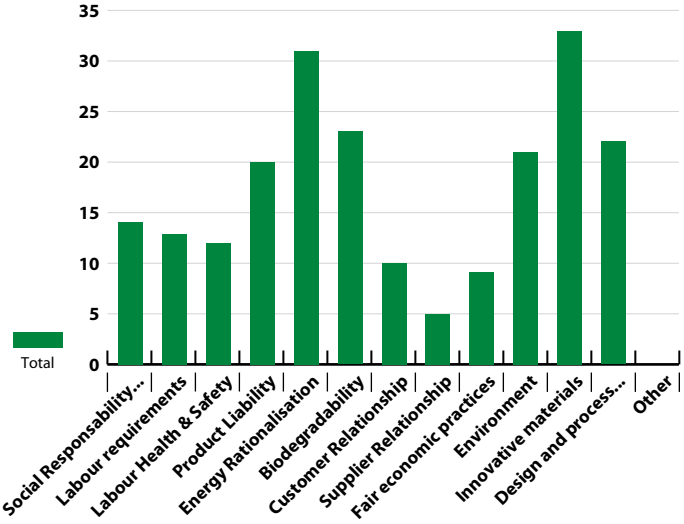


Lack of skills and competences

One of the last questions addressed which topics, regarding sustainability, represented a lack of skills and competences in their companies. The majority of replies indicated innovative materials and energy rationalisation, followed by biodegradability and design, process optimisation and environment. These replies prove the importance of implementing initiatives in this line, and the need for urgent actions in order to change this reality.

The new occupational profile in sustainable production to be developed within the project will represent a relevant step forward in addressing the shortage of these skills and competences.

Chart 16. Lack of skills and competences



The last question of the survey was left opened in order to give the opportunity to the companies to express their ideas on what would increase their competitiveness and facilitate the adoption of a sustainable manufacturing strategy in their companies.

Companies indicated different replies, particularly interesting was the one explicitly saying that they would need *"Investment in research to obtain new and more sustainable materials not available on the market today"*.

8. Executive Summary

Considering the repercussions that climate change has on the scarcity of natural resources, e.g. water and leather, as well as on the increase of energy prices, there is a clear need that the society - industry, policy makers, consumers, etc.- integrates best practices on environmental sustainability in their daily lives.

The European footwear industry cannot stay out of this trend if it wants to remain competitive, and companies will be reminded by consumers that such values need to be in the shoes that they choose to buy. Sustainability will progressively no longer be seen as moral obligation, but instead as part of the business strategy.

The Step 2 Sustainability project was conceived with this spirit in mind with a view to assisting footwear companies to improve the sustainability in their production by creating, developing and piloting a new occupation and qualification profile and the correspondent training course. The first project activity was to elaborate and distribute a questionnaire to companies around Europe in order to learn about their knowledge and understanding of environmental sustainability in their businesses as well as their training needs and priorities in this field.

In total 82 companies participated in the survey, mainly small and medium size enterprises, even if the ratio of larger companies interested in the questionnaire was higher than their level of representation in the European industry. The reason was certainly that they are currently more aware and able to address the challenge of producing more "green products".

As major threats for the industry, companies recognised the shortage of skilled workers, particularly in the production related areas, as well as the scarcity of raw materials. Whereas a large amount of companies declared having invested in research for alternative materials, SMEs recognised the need for external support in the education of the workforce, the most valuable asset of the industry. In terms of opportunities, the majority of participants to the survey agreed that e-commerce should be part of the distribution strategy because of its low cost and large geographical reach.

Moreover, the constant consumer demands provide an opportunity in terms of innovative products, and by understanding consumers' needs and values, the European footwear industry could provide more differentiated, customised and sustainable products.

In relation to sustainability, the information collected illustrated the interest and open attitude of the participants to the subject. Companies considered sustainability as one of the main areas, on which they could benefit from training, and in which they would like to invest. They were aware of the potential of sustainability and would like to learn how to maximise the use of resources, to cut energy costs, and open doors to new materials and production processes, etc. while being able to attract new customers. In line with this need, biodegradability was also declared to be areas in which there was a considerable lack of skills and competences and that needed to be addressed.

The analysis of the survey underlined that there is already certain awareness of the relevance of sustainability among footwear stakeholders, even if many steps still must be taken. The project "Step to Sustainability" will facilitate a tool that will contribute to the efforts of the European footwear companies to reach such sustainable values. In the globalized world of today, companies cannot anymore just aim at producing a comprehensive linear business strategy. In order to remain competitive and reach sustainable growth, companies need to look further and adopt a holistic approach that considers and anticipates the global trends and factors, among which the environmental sustainability in footwear manufacturing.

More information about the Leonardo project "Step to Sustainability" is available in **www.step2sustainability.eu**

The consortium of the project would like to particularly thank all the companies that participated in the survey and that made possible to develop this analysis on sustainable manufacturing in footwear.

Questionnaire on installed capacity to implement Sustainable Manufacturing in Footwear

1ST Version Tested

Is your company prepared to implement a Sustainable Manufacturing Strategy?

This questionnaire pretends to support you to understand and decide on the interest of starting up a successful sustainable manufacturing* strategy in your company, to assess the pre-requisites and needs of training.

It will take you ***10 min***.

* The manufacturing of goods using processes and systems having into account environmental, economic and social issues, meaning minimizing the negative environmental impacts, conserving energy and natural resources, that are safe and healthy for workers, communities, and consumers and are economically viable.

GENERAL INFORMATION

1.	**Company name** (not mandatory):
2.	**Country** (to be selected from a list):
3.	**Company web site**:
4.	**Does your company have a nominee with specific responsibilities for sustainability topics?**

1. YES
2. NO

Assessment grid available

5.	**Contact person:**
6.	**Function of contact person:**

1. CEO
2. Head of Production / Operations
3. Head of Marketing
4. Other, namely: _____

7.	**Phone number:**
8.	**E-email:**
9.	**Does the company comply any of the following standards?**

1. ISO 9001
2. ISO 14001
3. ISO 26000
4. Other, namely: _____

10. Nº Employees

1. < 50 employees, _____thereof in production
2. 51 to 100 employees, _____thereof in production
3. 101 to 250 employees, _____thereof in production
4. > 250 employees, _____thereof in production

11. Number of pairs of footwear produced in last year

1. < 1 000 pairs / day
2. 1001 to 5 000 pairs / day
3. 5 001 to 10 000 pairs / day
4. > 10 000 pairs / day
5. Or _____ pairs / year

12. Which type of shoes does your company produce? (multiple answers possible)

1. Ladies' shoes
2. Men's shoes
3. Children's shoes
4. Comfort shoes
5. Sports shoes
6. Occupational and safety footwear
7. Outdoor and hiking shoes
8. Slippers
9. Other, namely: _____

13. The average price (at which your shoes are sold to retail) per pair is …… €.

1. <10 €
2. Between 10-20 €
3. Between 20-30 €
4. Between 30-50 €
5. >50 €

14. By 2020, which of the global trends listed below could become a problem or a threat for your company? (multiple answer possible)

1. Globalisation
2. Re-shoring (relocate production back to your country)
3. Ageing of the European society
4. Global population growth
5. Scarcity of raw materials
6. Constantly increasing customer demands and rapid market changes (e. g. caused by urbanisation – city dwellers are more exposed to fashion trends than rural populations)s
7. Shortage of skilled workers
8. We consider these global trends to be advantageous for our company
9. Others

   _____
   _____
   _____
   _____
   _____
10. No statement possible

INNOVATION NEEDS

1. **What are the fields that research should concentrate on? What type of innovation would be particularly useful for your company? (multiple answers possible)**

1. Technology - Materials
2. Technology – Productive Equipment
3. Technology – incorporation of ICT
4. Product functionality / design
5. Business models
6. Marketing and commercialization
7. Management and Organization
8. Standards / regulation
9. Skills and competences of labour force
10. Other, namely: _____

2. **Has your company invested in innovative technologies / machines over the past five years?**

1. YES
2. NO

If so, what technology/machines did your company invest in?

_____
_____
_____

Have you identified technology/machines which would benefit your company? Which?

_____
_____
_____

3. **Which evolving trends have you identified in your relationship with your customers/retail? In which fields would you like to improve?**

_____
_____
_____

4. **What are the evolving trends in terms of consumer expectations towards your products? How will your company react to the identified trends?**

_____
_____
_____

5. **Does your company have a strategy in terms of the topics listed below? (multiple answers possible)**

1. Recyclable shoe materials and shoes
2. Biodegradable shoe materials and shoes
3. Use-and-return concept to take back and recycle your products
4. Repair service
5. Labelling of origin of materials
6. Labelling of code of conduct
7. Labelling regarding compliance with environmental and social standards
8. Materials and products hazardous substances evaluation
9. Audits, if yes, which:
   _____
   _____
   _____
10. Other, namely:
    _____
    _____
    _____

6. **Does your company suffer from the shortage of skilled workers?**

1. YES
2. NO

If so, what technology/machines did your company invest in?

_____
_____
_____

Which measures of the shoe industry to counteract the shortage of skilled workers would you consider effective?

_____
_____
_____

7. Does your company suffer from the shortage of skilled workers?

1. Fair trade shoes
2. Local production
3. Green production
4. Price
5. Healthy aspects of the product
6. High comfort
7. Brand
8. Fashion
9. Durability of the product and product components
10. Other, namely:
    _____
    _____
    _____

8. Which of the following statements most accurately describes your company's strategy in terms of sustainability ("green & clean production")?

1. My company invests money in order to improve energy efficiency, to save resources and become more environmentally friendly and more sustainable. The allocated budget amounts to _____€ and the specific aim is to _____
   _____
   _____
   _____
2. We do not have a specific strategy but we would like to learn more about possible measures and the related expenses and / or savings.
3. This is not a topic of interest for my company.
4. Other, namely _____
   _____
   _____
   _____

9. Is your company confronted with the market demands listed below (multiple answers possible)?

1. Individualisation / personalisation / customer-specific modification of the shoe in terms of style: colorway, logo, personalised embroidery etc.
2. Fitting customization (customer-specific materials, colours, but also fit / shape of the last / shoe bottom)
3. Optimised fit for certain target markets (please specify countries)
   _____
   _____
4. E-commerce
5. More and more rapid collection changes
6. Health / wellness
7. Social and environmental standards
8. Recyclable shoe / new materials («green materials»), specifically:
   _____
   _____
   _____
9. Irregular, fast and unforeseeable changes in customer requirements
10. Product diversity / interface machine-operator / flexibility of staff to be able to produce different shoe types
11. Other, namely _____
    _____
    _____
12. None of these

10. What kind of technical improvements would be useful for your company?

1. New quality control system
2. New Logistic solution
3. Process automation, specifically:
   _____
   _____
   _____
4. Individual machine improvements in order to
   i. become more flexible (shoe types/makes)
   ii. become more energy efficient
   iii. become more space-saving and lighter
   iv. use materials in a more efficient way
   v. become more sustainable in terms of
      i. recycling
      ii. chemical substances
      iii. work conditions
      iv. other, namely _____
      _____
5. Methodologies and working methods in order to
   i. become more flexible (shoe types/makes)
   ii. become more energy efficient
   iii. use materials in a more efficient way
   iv. become more sustainable in terms of
      i. recycling
      ii. chemical substances
      iii. work conditions
      iv. other, namely _____
      _____
6. New technical materials and components such as adhesives, toe and heel counters, soles, inserts etc.
7. Other, namely:
   _____
   _____

11. Which of the below listed key technologies (please see definitions in the glossary) have the potential to strengthen the competitiveness of your company? (multiple answers possible)

1. Advanced in-house and external logistic solutions **(AIELS)**
2. Hybrid manufacturing systems **(HMS)**
3. Highly responsive technologies for on-demand production **(HRToP)**
4. Resource-conscious machines and processes **(RCMP)**
5. Online and real-time quality assurance **(RTQA)**
6. Internet of Things / Internet of Machines **(IoT/IoM)**
7. Standardisation (of software tools, technical solutions etc.)
8. CAD-CAM
9. Automatic cutting systems
10. Robotization of production operations
11. RFID for an accurate inventory control, systematic checks of orders and incoming goods
12. Other, namely
    _____
    _____
    _____
13. None

GLOSSARY

AIELS: Advanced in-house and external logistic solutions which are conceived to increase both flexibility and adaptability of the company structure and the manufacturing process to market demands to ensure consistent customer orientation; reduce transport times in and between production lines and between production and consumer; better management of product availability at the right place at the right time.

HMS: Hybrid manufacturing systems using technologies such as *Selective Laser Sintering – SLS, Fused Deposition Modeling – FDM or 3D printing* (a digital model of a shoe component is transformed – layer by layer – into its physical implementation by solidifying powdery or melt-processable materials with different physical or chemical processes).

HRToP: Highly responsive technologies for on-demand production aiming to shorten the response time of the entire value creation chain to new market demands. Preconditions:

a. development of software solutions for material and production monitoring and control, enabling a closer integration of the IT systems of retail, manufacturing and suppliers;

b. an internet-based order placement system;

c. a highly flexible and adaptive production line, a new approach to product design as well as implementation of tools to enable mass customisation.

RCMP: Resource-conscious machines and processes; i.e. machines with a high degree of automation, equipped with self-learning software, featuring minimal consumption of energy and materials, as well as resource-conscious processes which are conceived in a resource-saving manner.

RTQA: Online and real-time quality assurance; this refers to the systematic activities implemented in a quality management system which ensures that the quality requirements for a product or service will be fulfilled. Online and real-time quality assurance implies that these activities are supported by an online quality data collecting system which can communicate in real time with the main system in order to analyse, compare, quantify and eventually to eliminate deviations from the predefined quality standards.

IoM: «Internet of Machines» is the application of the emerging paradigm of «Internet of Things» to the world of manufacturing. The concept «Internet of Things» is based on so-called «smart» objects, which – thanks to integrated information technology – have capabilities which go beyond their original destination, i.e. they are able to collect, process, and save data, and they can communicate and interact with their environment via internet.

TRAINING NEEDS

1. Has your company invested in staff training over the past five years?

1. YES
2. NO

a) If so, which department benefitted from staff trainings?

1. Marketing / sales
2. Quality
3. Health and safety
4. Social & environmental affairs
5. Design/Product engineering
6. Financial/administrative
7. Production
8. Logistics
9. Other, namely

_____

_____

b) If not, have you identified an area/department of your company which would benefit from a training course?

1. YES
2. NO

c) If so, what department from above are you thinking of?

1. Marketing / sales
2. Quality control
3. Health and safety affairss
4. Social & environmental affairs
5. Technical staff
6. Administrative staff
7. Management
8. Production workers
9. Other, namely

_____

_____

2. In what area could your company benefit from training?

1. Product creation – fashion
2. Technical product design
3. Materials
4. Production planning
5. Production optimisation
6. Sustainability: social, environmental and economic balance
7. Energy efficiency
8. Quality management
9. Machine operations (multiple skilled workers)
10. Process design (e.g. training to shorten process time from warehouse to packaging)
11. Marketing / sales
12. Other, namely

_____

_____

3. **Regarding Sustainability topics, which of the listed below represent a lack of skills/competencies in your company?**

1. Social Responsibility affairs
2. Labour requirements
3. Labour Health and Safety
4. Product liability (control of hazardous substances…)
5. Energy Rationalization
6. Biodegradability
7. Costumer Relationship
8. Supplier Relationship
9. Fairs economic practices
10. Environment
11. Innovative materials
12. Design and process optimization
13. Other, namely

_____
_____

4. **Do you wish to add ideas or other needs that would help to increase the competitiveness of your company and facilitate the adoption of a sustainable manufacturing strategy?**

_____
_____
_____
_____
_____
_____

More information about the project
www.step2sustainability.eu

– END –

Thank you very much for filling in this questionnaire, which will be treated entirely confidential.

Questionnaire on installed capacity to implement Sustainable Manufacturing in Footwear

Final Version

Is your company prepared to implement a Sustainable Manufacturing Strategy?

This questionnaire pretends to support you to understand and decide on the interest of starting up a successful sustainable manufacturing* strategy in your company, to assess the pre-requisites and needs of training.

It will take you ***15 min***.

* The manufacturing of goods using processes and systems having into account environmental, economic and social issues, meaning minimizing the negative environmental impacts, conserving energy and natural resources, that are safe and healthy for workers, communities, and consumers and are economically viable.

GENERAL INFORMATION

1. **Company name** (not mandatory):

2. **Country:**

3. **Company web site** (not mandatory):

4. **Contact person** (not mandatory):

5. **Phone number** (not mandatory):

6. **E-email** (not mandatory):

7. **Does your company have a nominee with specific responsibilities for sustainability topics?**

1. YES
2. NO

If yes, which department he/she works in: _____

8. **Function of contact person:**

1. CEO
2. Head of Production / Operations
3. Head of Marketing
4. Other, namely: _____

9. **Does the company comply or is it implementing any of the following standards?**

1. ISO 9001
2. ISO 14001
3. ISO 26000
4. Other, namely: _____

10. Nº Employees

1. < 50 employees, _____% thereof in production
2. 51 to 100 employees, _____% thereof in production
3. 101 to 250 employees, _____% thereof in production
4. > 250 employees, _____% thereof in production

11. Number of pairs of footwear produced in last year

1. < 500 pairs / day
2. 501 to 750 pairs / day
3. 751 to 1000 pairs / day
4. 1000 to 1500pairs / day
5. > 1500 pairs / day

12. Which type of shoes does your company produce and to whom is target to? (multiple answers possible)

In terms of target-group:

1. Ladies' shoes
2. Men's shoes
3. Children's shoes
4. Other, namely: _____

In terms of type of shoes:

1. High fashion shoes
2. Casual shoes
3. Sports shoes
4. Occupational and safety
5. Outdoor and hiking shoes
6. Orthopaedics
7. Other, namely: _____

13. The average selling price (factory price) per pair is ……. €.

1. <10 €
2. Between 10-20 €
3. Between 20-30 €
4. Between 30-50 €
5. >50 €

14. By 2020, which of the global trends listed below could become a problem or a threat for your company? (multiple answer possible)

1. Globalisation
2. Re-shoring (relocate production back to your country)
3. Ageing of the European society
4. Global population growth
5. Scarcity of raw materials / increasing price of raw materials
6. Constantly increasing customer demands (customization, green production, social and environmental standards…)
7. Rapid market changes (e. g. caused by urbanisation – city dwellers are more exposed to fashion trends than rural populations)
8. Shortage of skilled workers
9. Others

   _____
   _____
   _____
   _____
   _____
10. No statement possible

15. By 2020, which of the global trends listed below could become an opportunity? (multiple answer possible)

1. Globalisation
2. On-line sales
3. Re-shoring (relocate production back to your country)
4. Ageing of the European society
5. Global population growth
6. Constantly increasing customer demands (customization, green production, social and environmental standards…)
7. Rapid market changes (fashion trends, etc.)
8. Other remarks

   _____
   _____
   _____
   _____
   _____
9. No statement possible

INNOVATION NEEDS

1. What are the fields that research should concentrate on? What type of innovation would be particularly useful for your company? (multiple answers possible)

1. Technology - Materials
2. Technology – Productive Equipment
3. Technology – incorporation of ICT
4. Product functionality / design
5. Business models
6. Marketing and commercialization
7. Management and Organization
8. Standards / regulation
9. Skills and competences of labour force
10. Other, namely: _____

2. Has your company invested in innovative technologies / machines over the past five years?

1. YES
2. NO

If so, what technology/machines did your company invest in?

_____
_____
_____

Have you identified technology/machines which would benefit your company? Which?

_____
_____
_____

3. Which evolving trends have you identified in your relationship with your customers/retail? In which fields would you like to improve?

1. Individualisation / personalisation in terms of style
2. Fitting customization
3. On-line sales
4. Rapid collection changes
5. Healthy featuring
6. Social and environmental standards accomplishment
7. Use of "green materials"

8. Product diversity
9. Other, namely
   _____
   _____
   _____
10. None of these

How will your company react to the identified trends?
_____
_____
_____

4. Does your company have a strategy in terms of the topics listed below? (multiple answers possible)

1. Recyclable shoe materials and shoes
2. Biodegradable shoe materials and shoes
3. Use-and-return concept to take back and recycle your products
4. Repair service
5. Labelling of origin of materials
6. Labelling of code of conduct
7. Labelling regarding compliance with environmental and social standards
8. Labelling of origin of products
9. Materials and products hazardous substances evaluation
10. Audits, if yes, which:
    _____
    _____
    _____
11. Other, namely:
    _____
    _____
    _____

5. Does your company suffer from the shortage of skilled workers?

1. YES
2. NO

If so, in which areas? (multiple answers possible)

1. Administration
2. Marketing
3. Design
4. Modelling
5. Logistics
6. Production - Cutting
7. Production - Stitching
8. Production - Lasting
9. Production - Finishing
10. Other, namely:

_____
_____
_____

What are your company's countermeasures?

_____
_____
_____
_____

Which measures of the shoe industry to counteract the shortage of skilled workers would you consider effective?

_____
_____
_____
_____

6. Regarding the following aspects, please grade their influence and motivation of consumers to buy.

	List of aspects	Low influence / motivation to buy	High influence / motivation to buy	Not applicable / Don't know
1.	Fair economic practices			
2.	Local production			
3.	Green production			
4.	Price			
5.	Healthy and wellness			
6.	High comfort			
7.	Brand			
8.	Fashion			
9.	Durability			
10.	Origin of the product			
11.	Other (namely: _____			

7. Which of the following statements most accurately describes your company's strategy in terms of sustainability ("green & clean production")?

1. My company invests money in order to improve energy efficiency, to save resources and become more environmentally friendly and more sustainable.
2. We do not have a specific strategy but we would like to learn more about possible measures and the related expenses and / or savings.
3. This is not a topic of interest for my company
4. Other, namely _____
   _____
   _____

8. Is your company confronted with the market demands listed below (multiple answers possible)?

1. Individualisation / personalisation / customer-specific modification of the shoe in terms of style: colorway, logo, personalised embroidery etc.
2. Fitting customization (customer-specific materials, colours, but also fit / shape of the last / shoe bottom)
3. Optimised fit for certain target markets (please specify countries):
   _____
   _____
4. E-commerce B2B
5. E-commerce B2C
6. More and more rapid collection changes
7. Health / wellness
8. Social and environmental standards
9. Recyclable shoe / new materials («green materials»), specifically:
   _____
   _____
   _____
10. Irregular, fast and unforeseeable changes in customer requirements
11. Product diversity / interface machine-operator / flexibility of staff to be able to produce different shoe types
12. Other, namely _____
    _____
    _____
13. None of these

9. What kind of technical improvements would be useful for your company?

1. New quality control system
2. New Logistic solution
3. Process automation, specifically:
   _____
   _____
   _____
4. Individual machine improvements in order to
   i. become more flexible (shoe types/makes)
   ii. become more energy efficient
   iii. become more space-saving and lighter
   iv. use materials in a more efficient way
   v. become more sustainable in terms of
      i. recycling
      ii. chemical substances
      iii. work conditions
      iv. other, namely _____
      _____
5. Methodologies and working methods in order to
   i. become more flexible (shoe types/makes)
   ii. become more energy efficient
   iii. use materials in a more efficient way
   iv. become more sustainable in terms of
      i. recycling
      ii. chemical substances
      iii. work conditions
      iv. other, namely _____
      _____
6. New technical materials and components such as adhesives, toe and heel counters, soles, inserts etc.
7. Other, namely:
   _____
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10. Which of the below listed key technologies (please see definitions in the glossary) have the potential to strengthen the competitiveness of your company? (multiple answers possible)

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3. Highly responsive technologies for on-demand production (HRToP)
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6. Internet of Things / Internet of Machines (IoT/IoM)
7. Standardisation (of software tools, technical solutions etc.)
8. CAD-CAM
9. Automatic cutting systems
10. Robotization of production operations
11. RFID for an accurate inventory control, systematic checks of orders and incoming goods
12. Other, namely

    _____
    _____
    _____
13. None

GLOSSARY

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TRAINING NEEDS

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2. NO

a) If so, which department benefitted from staff trainings?

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2. Quality
3. Health and safety affairs
4. Social & environmental affairs
5. Design/Product engineering
6. Financial/administrative staff
7. Management
8. Production
9. Logistics
10. Other, namely

_____

_____

b) If not, have you identified an area/department of your company which should benefit from a training course?

1. YES
2. NO

c) If so, what department from above are you thinking of?

_____
_____
_____

2. In what area could your company benefit from training?

1. Product creation – fashion
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3. Materials
4. Production planning
5. Production optimisation
6. Sustainability: social, environmental and economic balance
7. Energy efficiency
8. Quality management
9. Machine operations (multiple skilled workers)
10. Process design (e.g. training to shorten process time from warehouse to packaging)
11. Marketing / sales
12. Other, namely

_____
_____

3. Regarding Sustainability, which of the topics listed below represent a lack of skills/competencies in your company?

1. Social Responsibility affairs
2. Labour requirements
3. Labour Health and Safety
4. Product liability (control of hazardous substances…)
5. Energy Rationalization
6. Biodegradability
7. Costumer Relationship
8. Supplier Relationship
9. Fair economic practices
10. Environment
11. Innovative materials
12. Design and process optimization
13. Other, namely

_____
_____

4.	**Do you wish to add ideas or other needs that would help to increase the competitiveness of your company and facilitate the adoption of a sustainable manufacturing strategy?**

_____
_____
_____
_____
_____
_____

More information about the project
www.step2sustainability.eu

– END –

Thank you very much for filling in this questionnaire, which will be treated entirely confidential.

Lifelong Learning Programme

Project Number:
539823-LLP-1-PT-LEONARDO-LMP

Project Duration:
30 months
October 2013 - March 2016

How to implement Sustainable Manufacturing in Footwear- new occupational profile and training opportunities

The project *STEP to SUSTAINABILITY* aims at:

Developing a new qualification profile and correspondent training in the field of sustainable manufacturing.

Training technicians with knowledge and skills to implement manufacturing strategies envisaging the sustainability in Footwear and Leather goods.

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This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.