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of the European Union

OI1 – Living Labs and "Circularity matters: gaps, limits and constraints in the EU furniture industry“ paper.

Circular Economy Living Labs and Manifesto

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1. Introduction

During the past few months, the *Circular Economy Living Labs* have been carried out. Through these activities, the different countries involved in the INFURI project have had the opportunity to get in touch with furniture companies, which have self-diagnosed themselves regarding their alignment with circular economy principles.

So far, all the participating countries have been able to collect information from six different companies (with the exception of Spain, which has been able to collect information from up to seven countries).

The results of this work are on the following pages. Subsequently, the participant countries are asked to fill up a document, in which support to understand and interpret their national results is requested.

It has to be considered that the sample of companies is not statistically representative, and that the methodology has not the aim of assessing the companies objectively and with by an independent verifier/auditor. And in consequence the results should not be taken as the measure of how circular are the furniture companies from the different countries.

The aim of the training material and the self-assessment questions is to show companies the concepts involved in circular economy and make them to reflex about the potential areas of improvement and boost them to implement new activities to improve their profile. In fact, the perception of two persons from the same company varies.

The additional benefit to INFURI project comes from a first identification of areas or concepts where companies feel stronger or weaker to facilitate focus on these topics and facilitate the exchange of good practices from companies/counties with higher scores to those with lower ones.

The Manifesto results are a more direct request from involved companies on the topics they want to receive training of in which they would like to collaborate with other companies.

All these will be considered at the MOOC to be developed at IO2, and also at the network of IO4.

2. Methodology and development of the instructions to perform the circular economy living labs with companies and the manifesto.

The living labs are based on a previous CIRCULAR ECONOMY SELF-DIAGNOSIS methodology developed by AIDIMME at the SPS-CIRC project: Research and development of Product Service Systems in a new Circular Economy environment in the wood, furniture, packaging and related sectors.

To develop the living lab with companies in the six participating countries, very detailed instructions and training material were developed by AIDIMME to the other partners. AIDIMME developed the circular economy concepts training material and also the Manifesto was designed.

Then the instructions to the other partners were developed, consisting of the following points:

1. Objectives of the session:
    - To involve the companies into the project. First contact and generate interest in collaborating in further activities.
    - To identify the maturity level and weak areas and also barriers to implement the circular economy model into the furniture companies. So we will have a valuable input to identify the training material to be developed.

2. Explanation of the benefits to the companies to engage them at the living lab:
    - First introduction to the circular economy model and involved topics.
    - Results from the self-evaluation from a wide conception of circular economy will globally position their organisation, and will identify the strong areas and weak points to improve if they want to implement this model into their company.

3. Steps to prepare the living lab in each country:
    - To translate the text of the self-diagnosis tool into your language. The translated texts were used by AIDIMME to programme a version of the self-diagnosis tool in the language of each country to facilitate the participation of the companies.

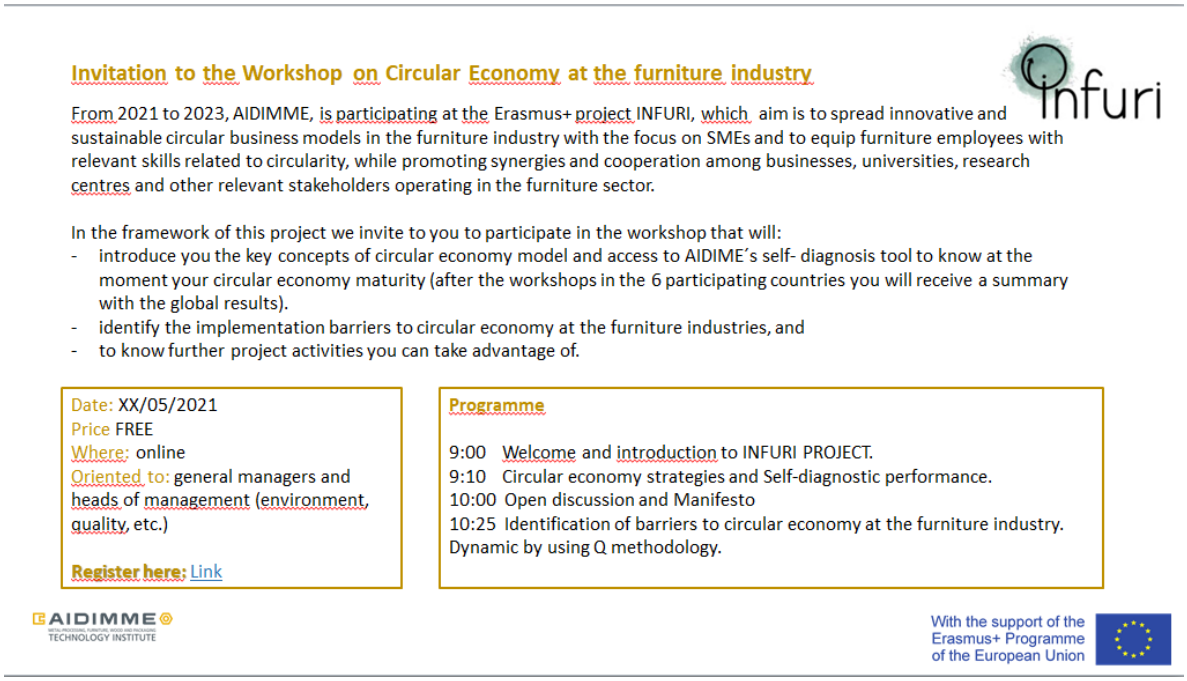
    - To translate the introduction on circular economy concepts into each country language (if it is necessary). These concepts are included at the self-diagnosis tool, and a previous knowledge and assimilation on them at the global structure of circular economy developed by AIDIMME, is necessary to allow companies to fulfil the self-diagnosis properly.

    - To invite at least 6 furniture manufacturing companies* from your country.
      Profile of participants: CEO or intermediate managers with overview of company´s strategy/status regarding circular economy (environmental/quality managers, etc.).
      Invitation example.

      *Companies manufacturing raw materials (boards, fittings) or only retailers are not so interesting to this session, there are preferred final product manufacturing companies to cover the whole life cycle of the furniture product.

    - Send to them the “Manifesto” template to be completed (before the session or at the end of it) and ask them some final questions about the living lab.

The mentioned material: "self-diagnosis tool" translated to each language "circular economy concepts (ppt reduced version)" plus the "Manifesto template" and the quality questionnaire, and even the "Invitation" template, were provided in English. The reduced provided material of circular economy concepts are attached as Annex to this report.



Invitation to the Workshop on Circular Economy at the furniture industry

From 2021 to 2023, AIDIMME, is participating at the Erasmus+ project INFURI, which aim is to spread innovative and sustainable circular business models in the furniture industry with the focus on SMEs and to equip furniture employees with relevant skills related to circularity, while promoting synergies and cooperation among businesses, universities, research centres and other relevant stakeholders operating in the furniture sector.

In the framework of this project we invite to you to participate in the workshop that will:

- introduce you the key concepts of circular economy model and access to AIDIME´s self- diagnosis tool to know at the moment your circular economy maturity (after the workshops in the 6 participating countries you will receive a summary with the global results).
- identify the implementation barriers to circular economy at the furniture industries, and
- to know further project activities you can take advantage of.

Date: XX/05/2021
Price FREE
Where: online
Oriented to: general managers and heads of management (environment, quality, etc.)

Register here: Link

Programme

9:00 Welcome and introduction to INFURI PROJECT.
9:10 Circular economy strategies and Self-diagnostic performance.
10:00 Open discussion and Manifesto
10:25 Identification of barriers to circular economy at the furniture industry. Dynamic by using Q methodology.

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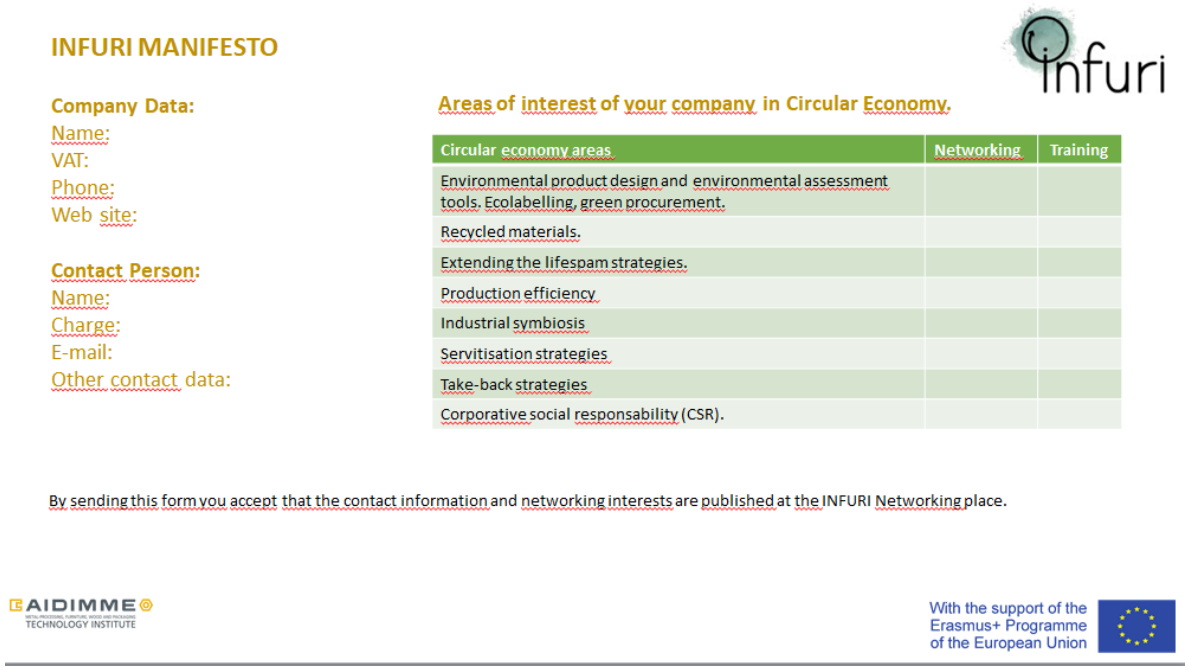
Fig. 1. Invitation example provided.



INFURI MANIFESTO

Company Data:
Name:
VAT:
Phone:
Web site:

Contact Person:
Name:
Charge:
E-mail:
Other contact data:

Areas of interest of your company in Circular Economy.

Circular economy areas	Networking	Training
Environmental product design and environmental assessment tools. Ecolabelling, green procurement.		
Recycled materials.		
Extending the lifespam strategies.		
Production efficiency		
Industrial symbiosis		
Servitisation strategies		
Take-back strategies		
Corporative social responsability (CSR).		

By sending this form you accept that the contact information and networking interests are published at the INFURI Networking place.

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Fig. 2. Manifesto template provided.

SPS-CIRC:

Research and development of product-service systems in a new circular economy environment in the wood, furniture, packaging and related sectors.

SELF-DIAGNOSIS QUESTIONNAIRE to evaluate the degree of CIRCULARITY of companies in the wood, furniture, packaging and related sectors.

nstructions: Next we are going to present you with a series of statements, rate from 1 to 10 how much you agree with each one of them. Being 10 the score that you must select if you totally agree with it and 1 the score that you must select if you completely disagree with the statement, you do not do it or it does not apply to your company.

Access the Self-Diagnosis ->

AIDIMME INSTITUTO TECNOLÓGICO | GENERALITAT VALENCIANA TOTS A UNA veu | iVACE | UNIÓN EUROPEA Fondo Europeo de Desarrollo Regional — Una manera de hacer Europa

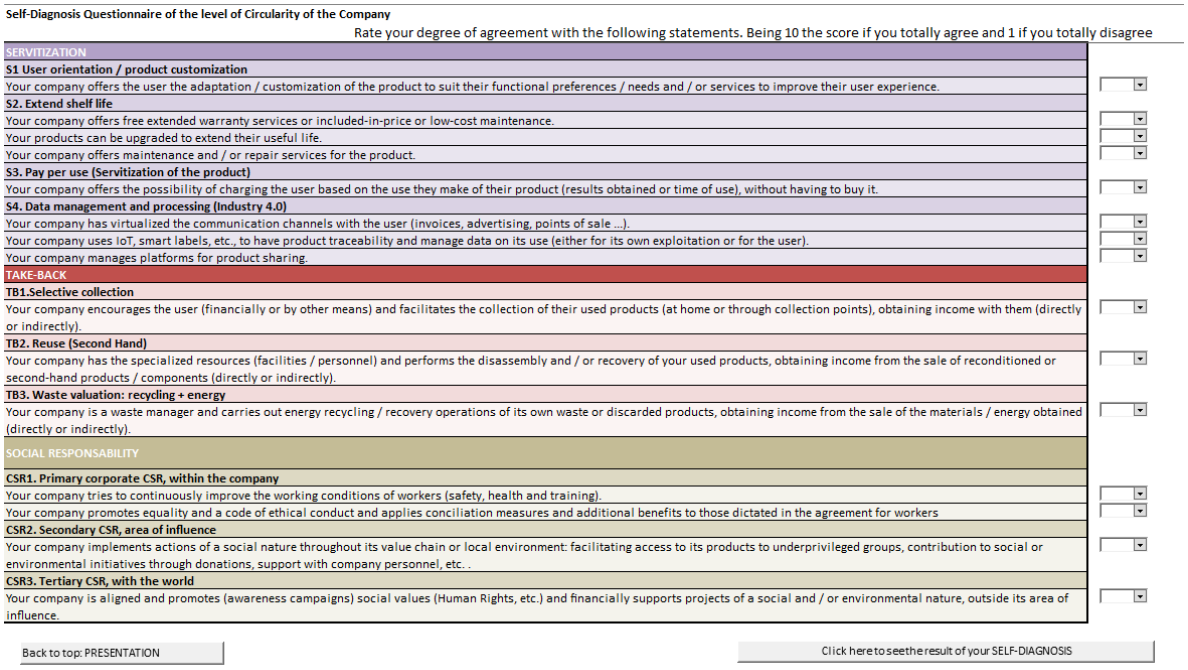
Figure 3. Self-diagnosis tool provided: presentation.

Self-Diagnosis Questionnaire of the level of Circularity of the Company

Rate your degree of agreement with the following statements. Being 10 the score if you totally agree and 1 if you totally disagree

ECODESIGN	
E1. Ecodesign management and environmental communication	VALUE
Your company, certified ISO 14006, reduces the environmental impact of your products by considering all stages of their life cycle, evaluating environmental impacts with the life cycle assessment (LCA) methodology.	
Your company establishes environmental requirements for the acquisition of raw materials and services, and selects its suppliers based on them.	
Your company communicate the (verifiable) environmental benefits of your products to your customers.	
E2. Design aimed at reducing the use / consumption of resources	
Your company offers products made from secondary (recycled) raw materials or renewable raw materials.	
Your company designs its products trying to minimize the use of resources (raw materials, energy consumption, lighten weight ...).	
E3. Product functional optimization	
The product that your company sells is efficient in use, it allows the user to save money effortlessly compared to other competitors.	
Your company have carried out market studies that aimed at at identifying the real needs of the user and adapting the value proposition.	
Your company offers information to the customer / user through the Web to improve the performance / experience of using the product (for example, tutorials or usage tips so that they consume	
E4. Extend shelf life	
Durability as a competitive advantage: the design and easy maintenance of its products give them a longer useful life than alternative products that can be found on the market.	
His company designs modular products with accessible and reversible joints to facilitate both the update and the repair of the product, having replacement parts at a competitive price for a reasonable period.	
E5. Design aimed at valuing the end of life	
Your company designs to make it easy to separate components or materials for reuse or recycling.	
Your company tries to use easily recyclable materials.	
EFFICIENT PRODUCTION	
EP1. Environmental management systems	
Your company updates and checks that fulfills with all the applicable environmental legislation.	
Your company, certified ISO14001 or EMAS, identifies, controls and establishes measures to reduce the environmental impacts derived from its activity.	
EP2. Lean Manufacturing + Industry 4.0	
Your company has incorporated technologies (Lean Manufacturing + Industry 4.0) to improve its processes and reduce its production costs, time to manufacture a unit and the related environmental impact.	
Your company actively collaborates with suppliers and customers to implement transparency and agility in the flow of information.	
EP3. Industrial symbiosis	
Your company collaborates and has agreements with other companies for the shared use of services or the purchase and sale of residual effluents that are used as a resource.	
EP4. Efficient technologies	
Your company invests in efficient technologies in the use of raw materials and energy consumption, using energy from renewable sources.	
EP5. Efficient logistics (supply and distribution)	
Your company works with suppliers as direct and close as possible and has a system to optimize distribution logistics (km, vehicle loading, vehicle consumption).	
EP6. Remanufacturing	
Your company has the necessary infrastructure and earns income from the repair, reprocessing and manufacture of new products with raw materials recovered from other products / waste at its end of life.	

Fig. 4. Self-diagnosis tool provided: questions (I).



Self-Diagnosis Questionnaire of the level of Circularity of the Company

Rate your degree of agreement with the following statements. Being 10 the score if you totally agree and 1 if you totally disagree

SERVITIZATION	
S1 User orientation / product customization	
Your company offers the user the adaptation / customization of the product to suit their functional preferences / needs and / or services to improve their user experience.	
S2. Extend shelf life	
Your company offers free extended warranty services or included-in-price or low-cost maintenance.	
Your products can be upgraded to extend their useful life.	
Your company offers maintenance and / or repair services for the product.	
S3. Pay per use (Servitization of the product)	
Your company offers the possibility of charging the user based on the use they make of their product (results obtained or time of use), without having to buy it.	
S4. Data management and processing (Industry 4.0)	
Your company has virtualized the communication channels with the user (invoices, advertising, points of sale ...).	
Your company uses IoT, smart labels, etc., to have product traceability and manage data on its use (either for its own exploitation or for the user).	
Your company manages platforms for product sharing.	
TAKE-BACK	
TB1.Selective collection	
Your company encourages the user (financially or by other means) and facilitates the collection of their used products (at home or through collection points), obtaining income with them (directly or indirectly).	
TB2. Reuse (Second Hand)	
Your company has the specialized resources (facilities / personnel) and performs the disassembly and / or recovery of your used products, obtaining income from the sale of reconditioned or second-hand products / components (directly or indirectly).	
TB3. Waste valuation: recycling + energy	
Your company is a waste manager and carries out energy recycling / recovery operations of its own waste or discarded products, obtaining income from the sale of the materials / energy obtained (directly or indirectly).	
SOCIAL RESPONSABILITY	
CSR1. Primary corporate CSR, within the company	
Your company tries to continuously improve the working conditions of workers (safety, health and training).	
Your company promotes equality and a code of ethical conduct and applies conciliation measures and additional benefits to those dictated in the agreement for workers	
CSR2. Secondary CSR, area of influence	
Your company implements actions of a social nature throughout its value chain or local environment: facilitating access to its products to underprivileged groups, contribution to social or environmental initiatives through donations, support with company personnel, etc. .	
CSR3. Tertiary CSR, with the world	
Your company is aligned and promotes (awareness campaigns) social values (Human Rights, etc.) and financially supports projects of a social and / or environmental nature, outside its area of influence.	

Back to top: PRESENTATION

Click here to see the result of your SELF-DIAGNOSIS

Fig. 5. Self-diagnosis tool provided: questions (II).

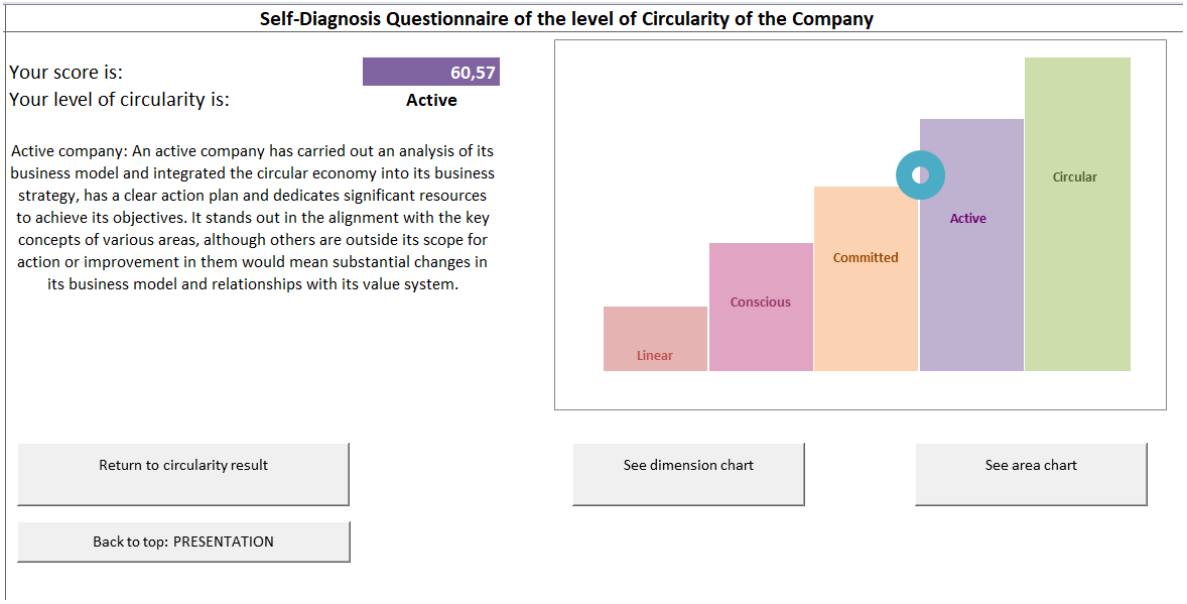
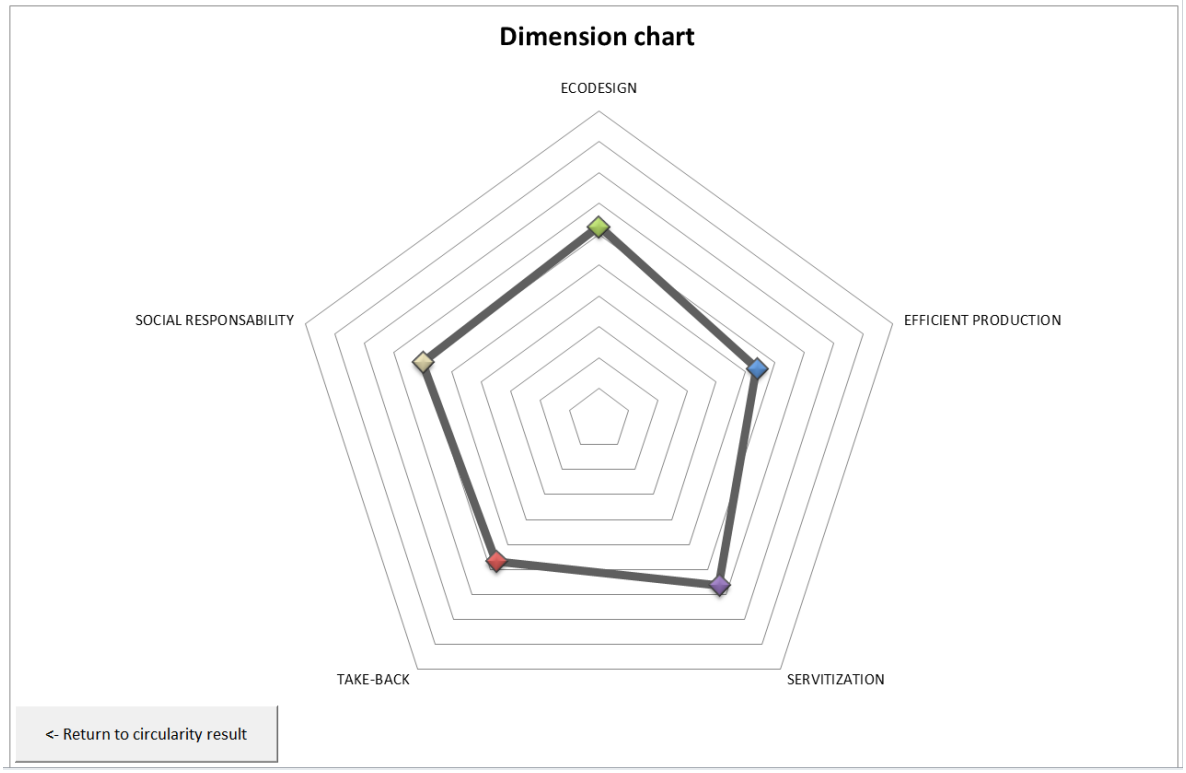


Fig. 6. Self-diagnosis tool provided. Results: circularity level.



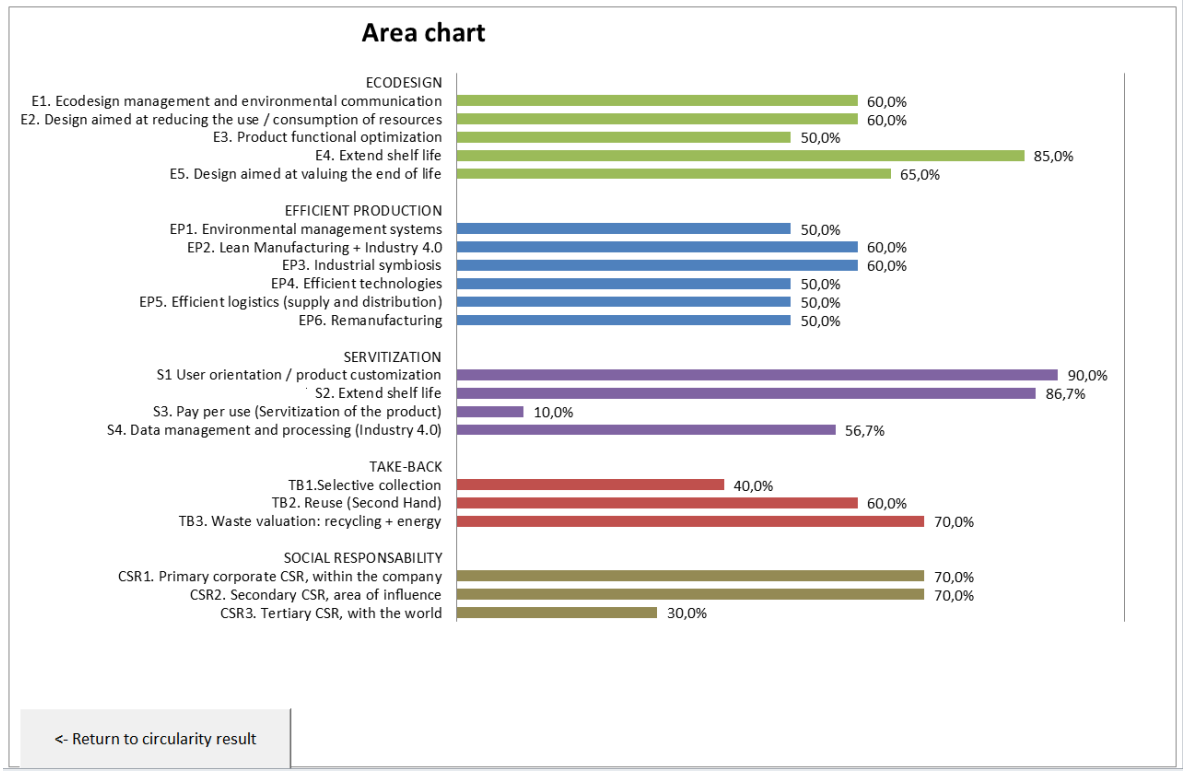
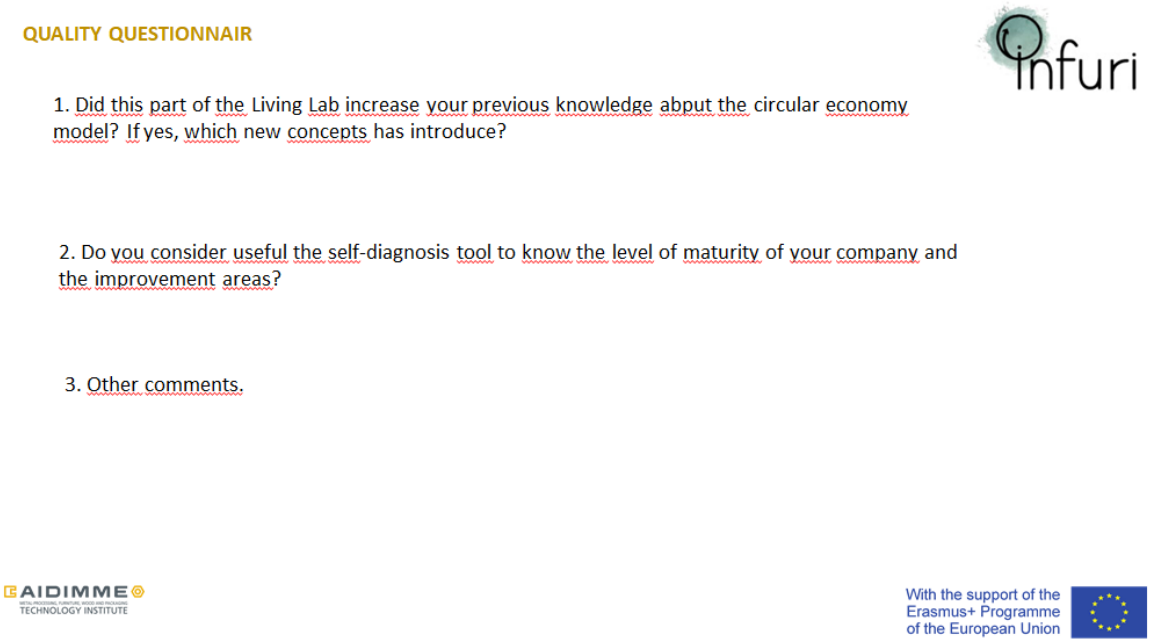


Fig. 7. Self-diagnosis tool provided. Results: circularity dimensions and areas charts.



QUALITY QUESTIONNAIR

1. Did this part of the Living Lab increase your previous knowledge abput the circular economy model? If yes, which new concepts has introduce?

2. Do you consider useful the self-diagnosis tool to know the level of maturity of your company and the improvement areas?

3. Other comments.

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Fig. 8. Questions provided.

Confidentiality considerations were also provided:

- The manifesto includes an statement regarding the permit to share the information on it at the INFURI Network.
- The name of the company and person participating in the Living Lab will not be used in a public document, only to justify the development of the activity to the National Authority.
- The results from the self-diagnosis will be presented (public) all together, not individually, so they will be anonymous (only the responsible partner from each country will have the traceability).

Finally, the instructions included the steps and material to be reported after the living lab session to AIDIMME, in order to analyse and compile the results:

- List of participants (company and person)
- Picture/s from the development of the Living Lab.
- Self-diagnosis questionnair completed by each participant usign “safe as” option and:
- coding the file name with the country abrebbiature and number of the participant (for Spain: SP-1,...,SP6).
- coding the file name with the country abrebbiature and name of the participant (for Spain: SP-XXXX,...,SPYYYY). This copy is to be keep by you, not to send to AIDIMME.
- Self-diagnosis questionnair completed with the media of each country (usign “safe as” option and coding the file name with the country abrebbiature).
- Questionnare about the Living Lab completed by each participant. (Same anonimous code to each participant).

- Manifesto from each company. If you collect them in your own language, a Google form in English will be available to share the data into the consortium. As this document has names, please check consistency with the self-diagnosis (weak areas = interest on training?) before to send all the documents and if something take notes to discuss it further anonimously.

Once provided the previous information, AIDIMME analysed and presented to the partners the self-diagnosis results, by country and comparing them. The final step of the analysis was to prepare an specific formularies to each country in order to support the conclusions with the economical, cultural and market or legislative national context. Provided formularies are attached as annex.

3. Development of the circular economy living labs

The living labs were carried out differently due to the peculiarities of the companies chosen by each partner and to the local restrictions implemented as a result of the COVID-19. The details can be seen on the following table:

Country	Modality	Duration	Nº of participants
Greece	Online	2h	6 companies
Italy	Online	2h	6 companies
Netherlands	On-site	2h	6 companies
Poland	Online	3h	6 companies
Slovenia	On-site	2h	6 companies
Spain	Online	3h	7 companies

On every session, this agenda was tried to be followed:

1. Introduction to the Circular Economy and the INFURI project.
2. Description and performance of the assessments that need to be carried out (both self-assessment and Q-Methodology forms).
3. Q&A

The participant companies had different profiles, in respect to their activity, but mostly in regards to their size and business volume. In general terms, all were wood furniture production related companies which sales vary between local or regional clients and an international market.

On the other hand, regarding the living labs, all the sessions followed a similar structure. The agenda of the events included an introduction of the INFURI project and a presentation of the different circular economy strategies considered in the framework of the project.

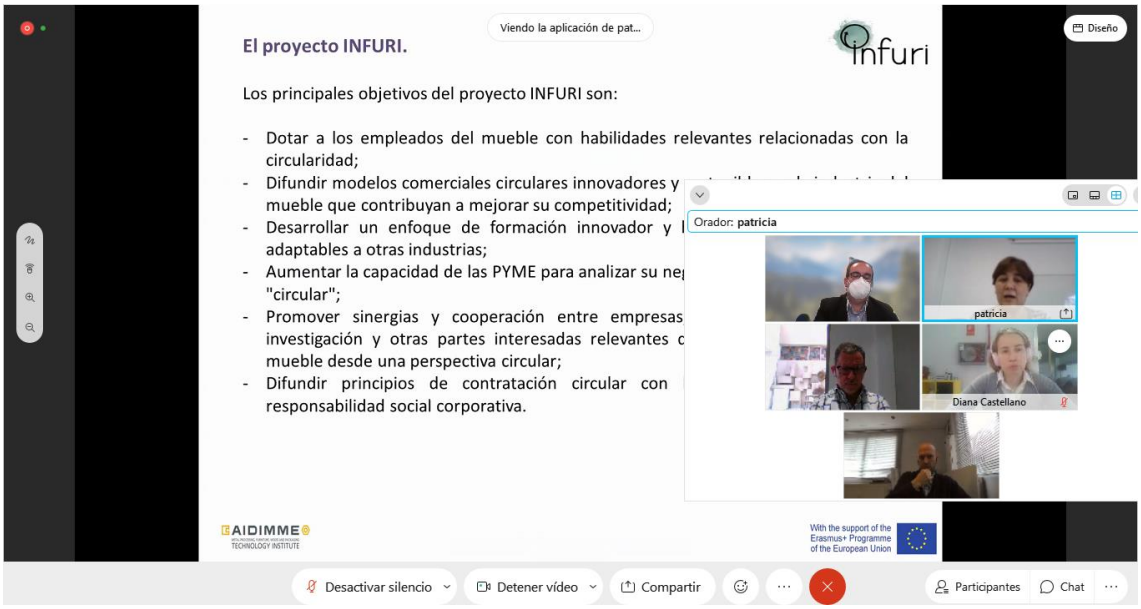


Image 1: Spanish session screenshot.

Next, the self-assessment questioners were carried out by the participants. They were given a formulary designed in order to estimate the self-perceived performance in all the circular economy dimensions described. In addition, in these meetings the Q-Methodology formularies in which the companies could point the challenges and barriers they have to face when moving towards a circular model were also filled. These formularies, which were also important for the development of this Intellectual Output (IO1), are not subject of discussion of this report.

Image 2: Dutch session

4. Self-assessment results

4.1. General Results

In general terms, all of the companies involved see themselves relatively committed (or even active) with the Circular Economy. The results that table 1 show are the average results for each participant country.

COUNTRIES	Greece	Italy	Netherlands	Poland	Slovenia	Spain
Nº COMPANIES	6	6	6	6	6	7
AVERAGE OF CIRCULAR ECONOMY ALIGNMENT PERCEPTION	71.14	72,29	60,57	68,00	58,86	57,43
	Active	Active	Committed	Active	Committed	Committed

Table 1: Average results

Also, a general comparison regarding the five areas in which the self-diagnose questions are grouped has been carried out, as it can be seen in figure 3.

At a glance, it can be noted that Italian companies have achieved the best results, with the exception of the *Take-back* dimension (in which Greek companies have considered themselves in a much positive way than the rest of the companies involved in the project) and *Servitization* dimension (in which Polish companies got the best results).

The results from ecodesign dimension are relatively near (similar) between countries, while they are more diverse in the rest of the dimensions, especially at the take-back dimension.

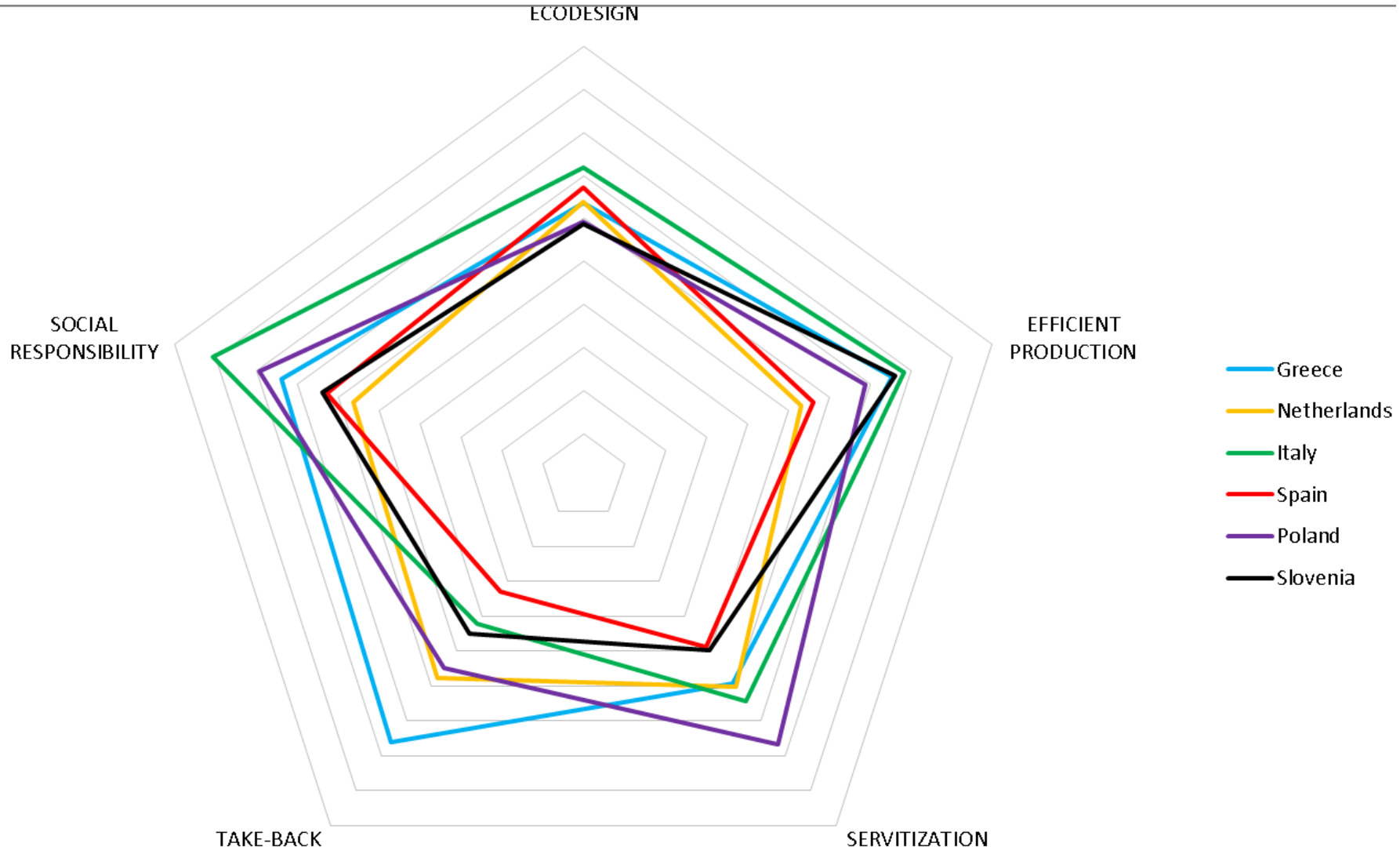


Fig. 3: Countries average results by dimension

A closer look to the results of each country is taken on the following lines.

4.2. Greece

As it can be seen in figure 4, Greek companies consider themselves to be especially strong with respect to *Take-back* (the maximum value achieved) and at *Efficient production*. However, the main weaknesses detected are in the dimension of *Ecodesign*.

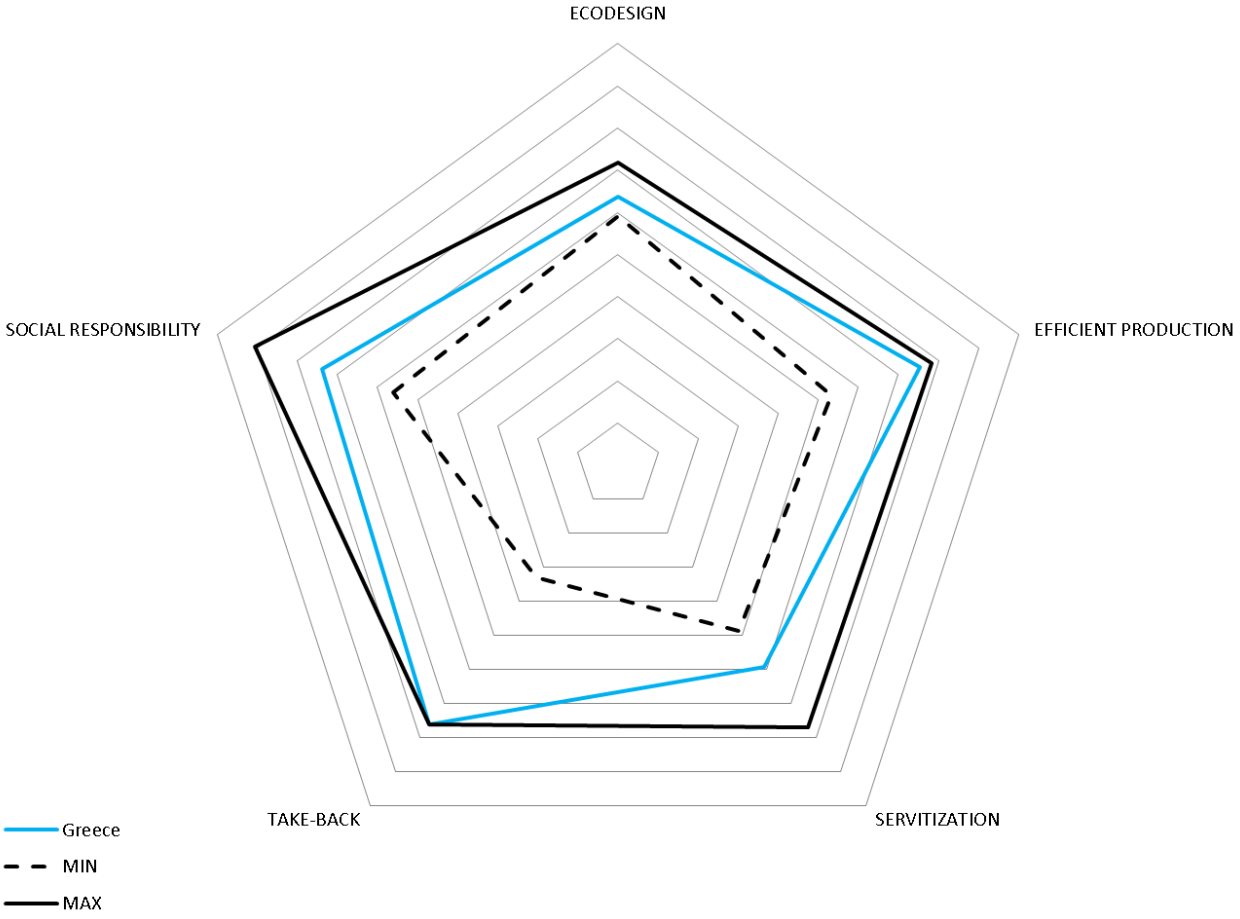


Fig. 4: Greek companies results

These results are more comprehensible when figure 5 is studied. As it can be seen, there is a bad self-perception regarding *Extend shelf life* topic (which affects both *Ecodesign* [E4] and *Servitization* [S2]). Also, none of the companies considered their products to be managed as a *pay per use* product (S3), which has also affected *Servitization*.

Regarding Ecodesign dimension, they stand out at *design for consume reduction*, and also regarding *environmental communication* and *use of renewable/recyclable materials*. On the other hand, none of the Greek companies evaluated the design of modular products with accessible and reversible joints to facilitate both the update and the repair of the product. This has been explained as a product of cultural factors, since Greek users tend to value product's lifetime over reparability.
Same happens with the good results regarding *Take-back*; it is common in Greece the collection, repair and donation of goods (a cycle in which companies tend to get involved), but also the energy recovery with that waste that cannot be recovered.

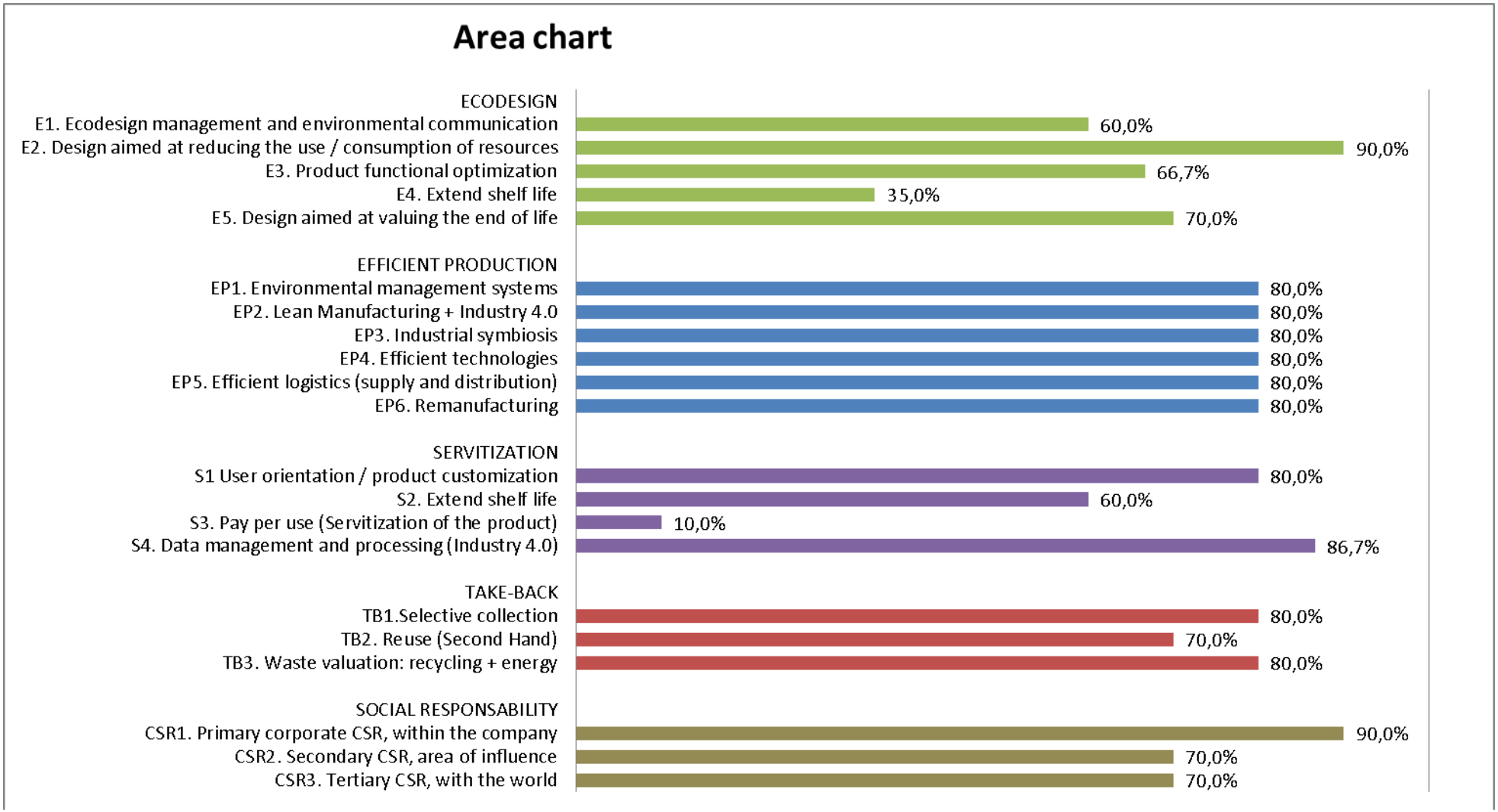


Fig. 5: Greek average qualifications detailed

4.3. Italy

The main strengths of the Italian companies, according to their self-perception, are the *Efficient production*, *Social Responsibility* and *Ecodesign* (as it can be seen in figure 6). On the other hand, the result regarding *Take-back* can be considered as quite poor.

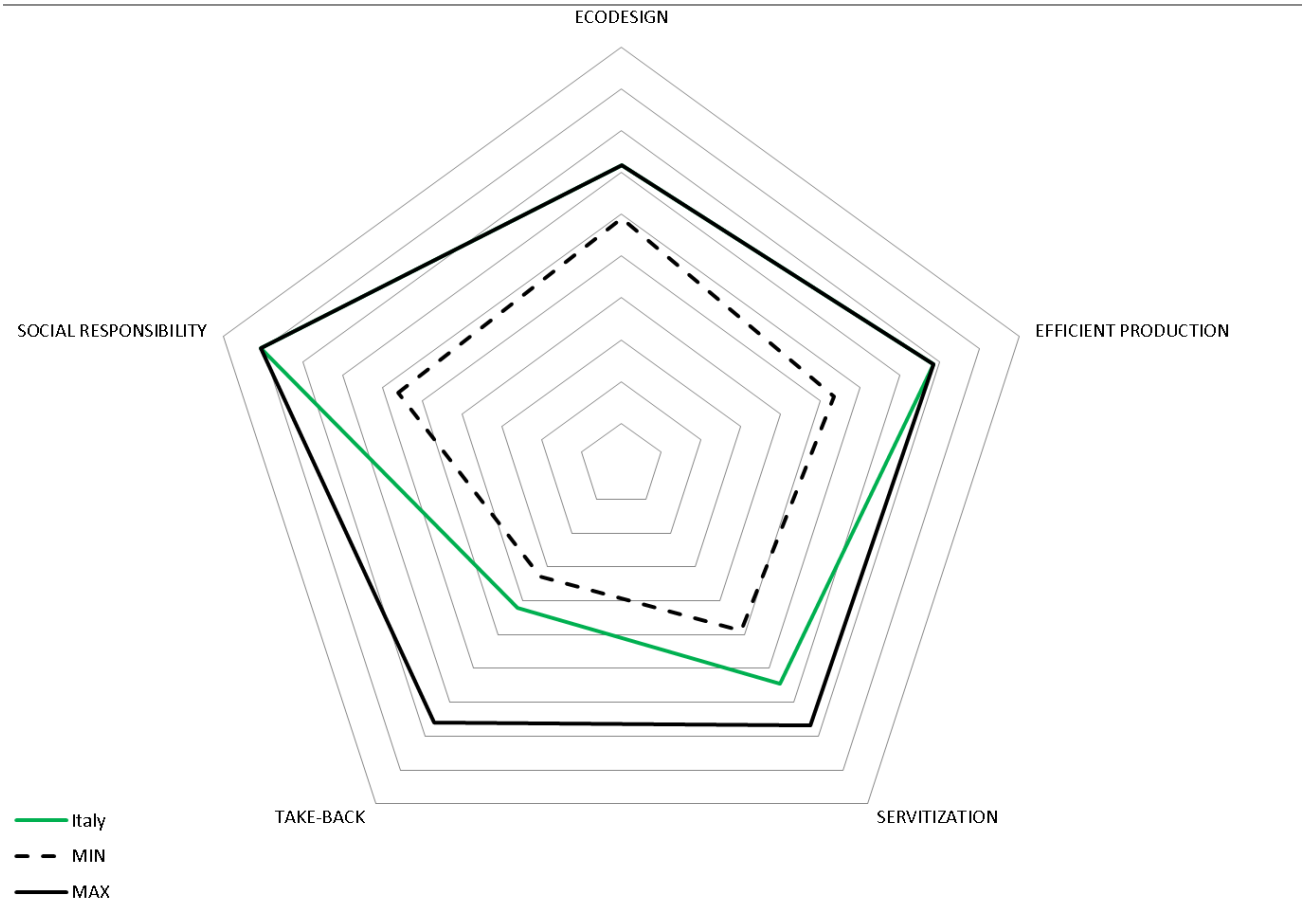


Fig. 6: Italian companies results

A closer look to the answers detailed (figure 7), shows that the poor results in *Take-back* area are due to the bad result when evaluating *Selective collection* (TB1) and *Reuse* (TB2). These bad results might be related to the current waste management value chain implemented in Italy; being externalised, the system would require dedicated agreements and differentiation of the collecting schemes to access the post-consumer wastes. While the take-back approach is already implemented for electronic waste, it's foreseen that the Extended Producer Responsibility (EPR) will have a significant impact also in the furniture sector.

In addition, the results as to *Servitization* have been affected negatively as a result of the bad self-perception when evaluating *Pay per use* (S3).

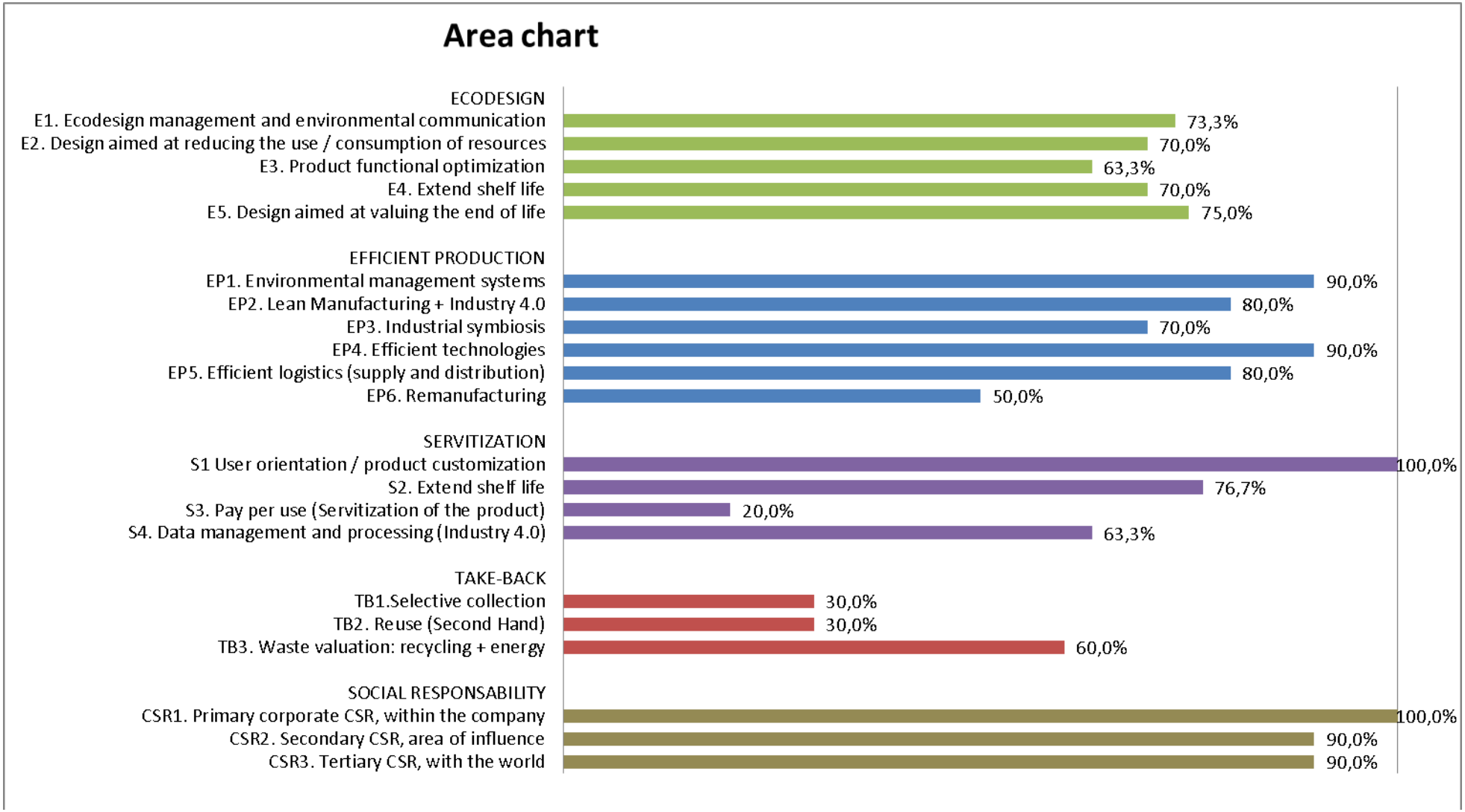


Fig. 7: Italian average qualifications detailed

4.4. Netherlands

Dutch results show no strengths or weaknesses, since the results obtained are quite equal between each other (figure 8). It is true, however, that both *Social responsibility* and *Efficient production* results turn out to be the lowest average evaluation (in comparison with the rest of assessments). However, Dutch companies self-diagnosed positively regarding *durability and modular products design* and *customization* (figure 9).

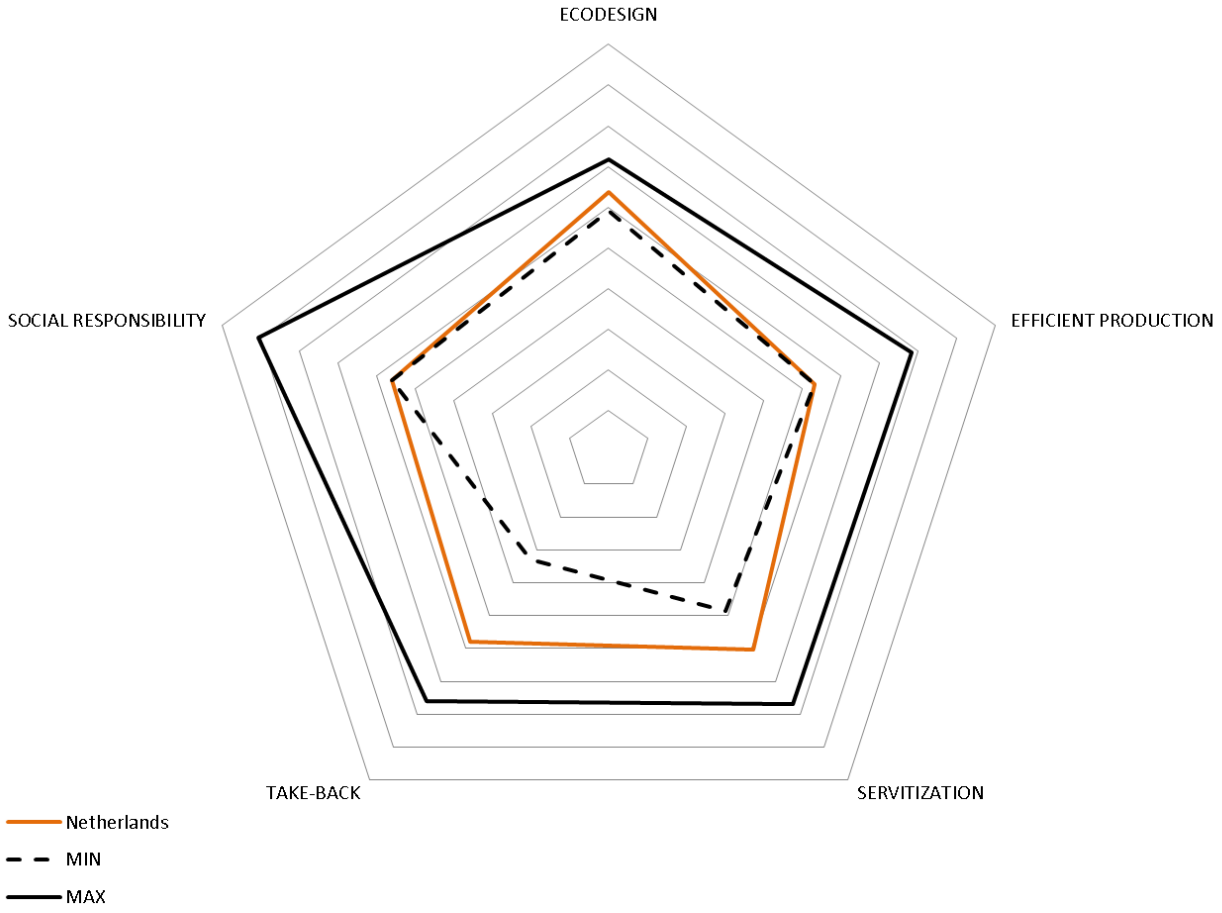


Fig. 8: Dutch companies results

When looked in detail, however, the answers show some weaknesses that have affected the average qualifications (figure 7). The *Efficient production* evaluation has, in general, a poor evaluation (since all the topics have been self-assess negatively by the companies). On the other hand, the poor result as to T*ake-back is* due to the bad result when evaluating *Selective collection* (TB1).

Social responsibility bad results are a consequence of the bad result when evaluating *Tertiary CSR* (CSR3). However, good assessment in respect to *Secondary CSR* (CSR2) was obtained, due to the strategies implemented recently by Dutch government (Green Deal Cicular Procurement, for example). Additionally, while the poor result regarding *Servitization* is a consequence of the bad result when evaluating *Pay per use* (S3), the rest of the topics got a better evaluation. These good results regarding, for example, customization have been explained as a consequence of the peculiarities of the Dutch market (which is characterized by a consumer with a broad interest in decorating and personalizing his or her home).

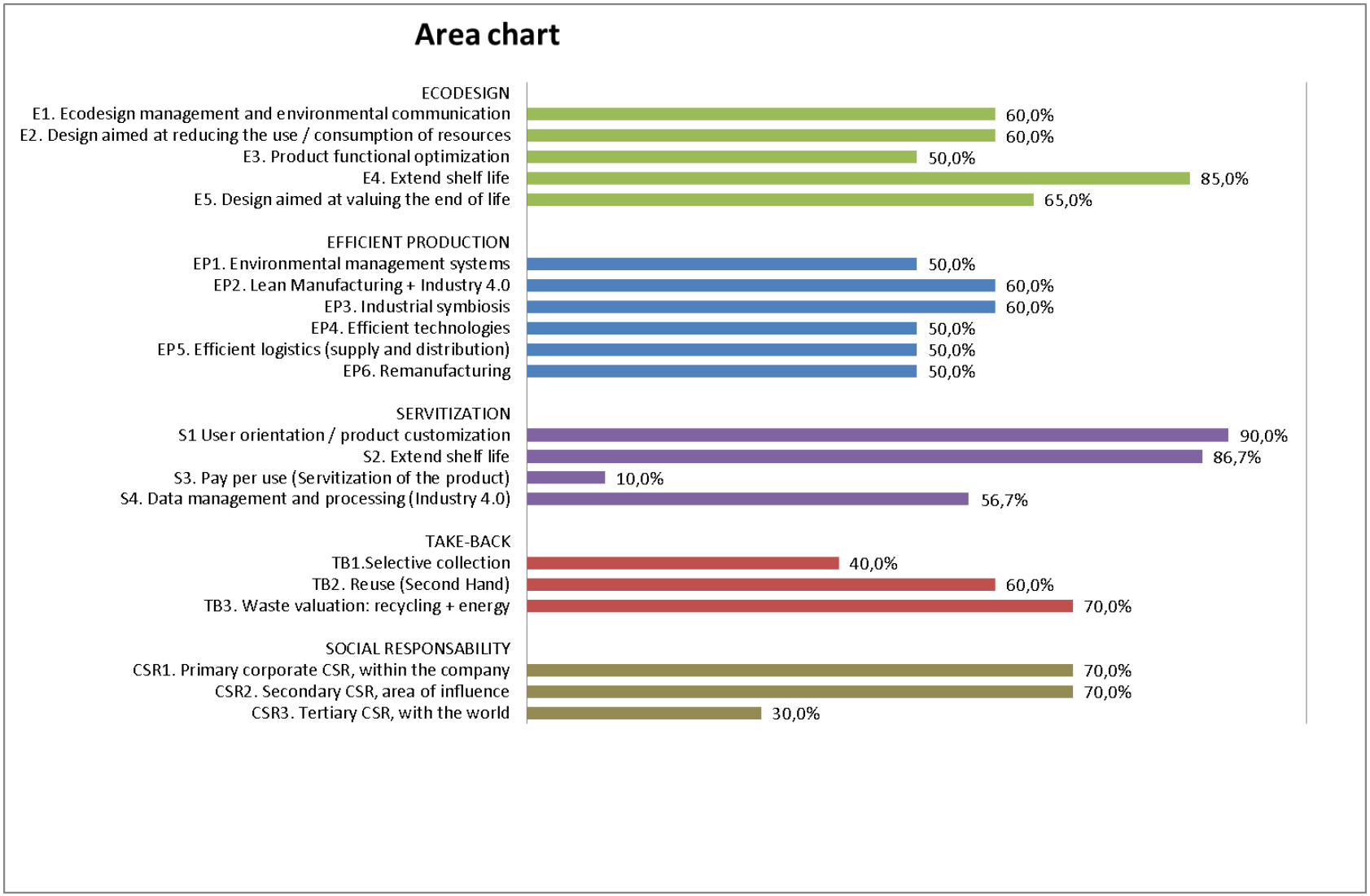


Fig. 9: Dutch average qualifications detailed

4.5. Poland

As it can be seen in figure 10, Polish results have their main strength in *Servitization* (in fact, this result is the maximum average achieved by the participant countries). On the other hand, however, its main weakness is the *Ecodesign* dimension (in this case, the average is almost the minimum compared with the other countries).

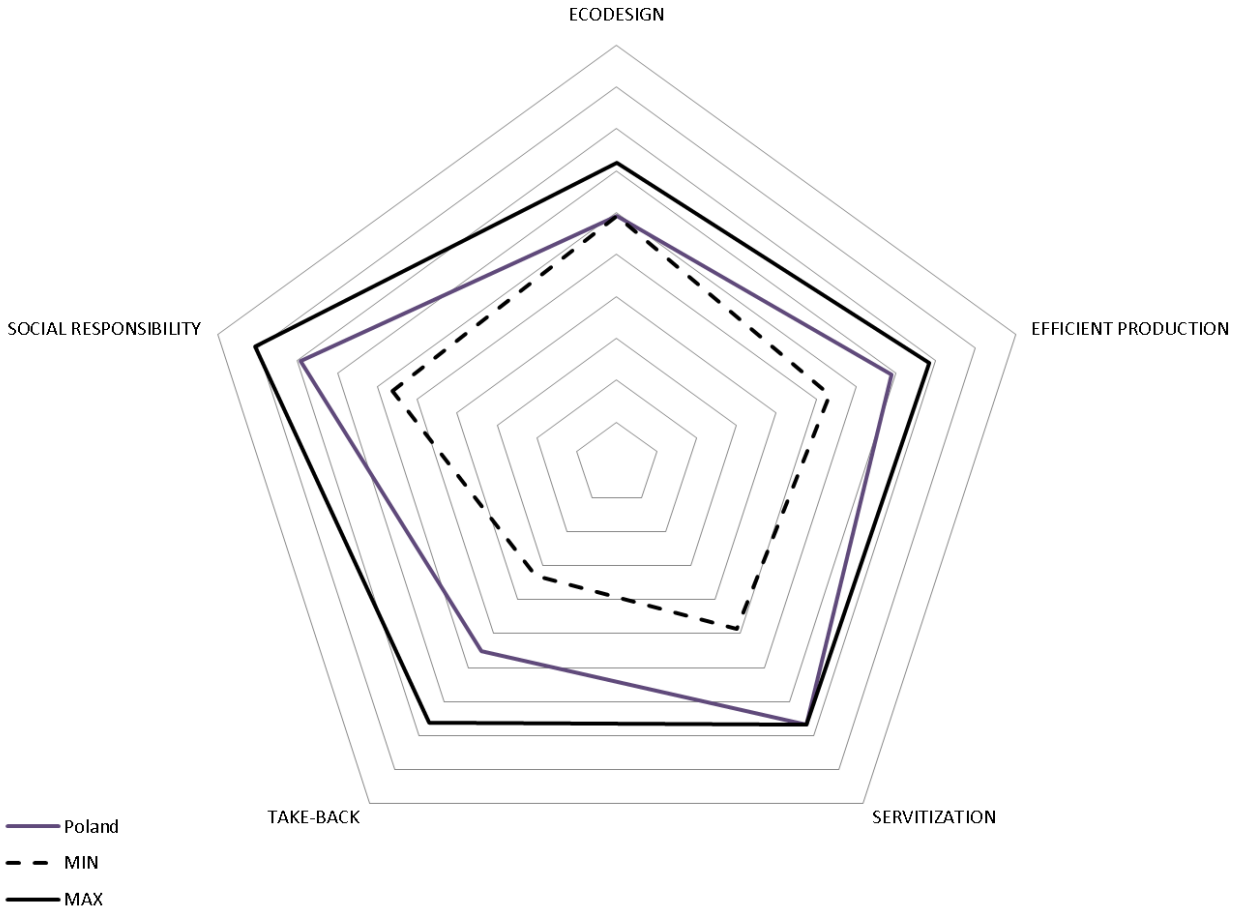


Fig. 10: Polish companies results

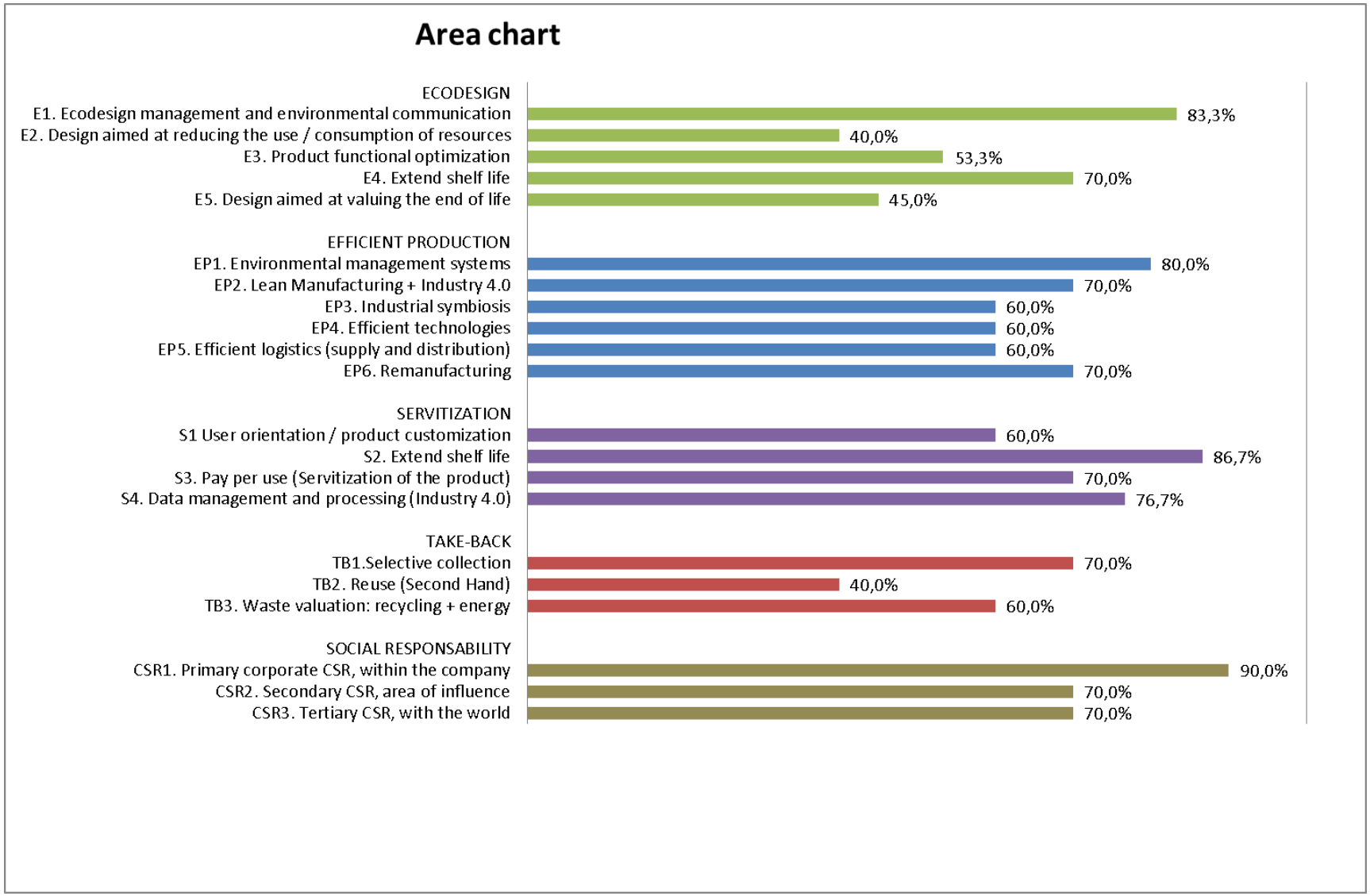


Fig. 11: Polish average qualifications detailed

Taking a detailed look to the results (figure 11) we can see some interesting results:

- Self-diagnosed Polish companies consider themselves to be strong in respect to *Pay per use* (S3). This is a unique case, since the rest of countries showed bad results when evaluating this concept.

- Results regarding designing to the extension of the products shelf life were remarkably good. The same happened regarding "Industry 4.0".

- Despite the average bad result regarding *Ecodesign*, the average self-diagnosed in respect to *Ecodesign management and environmental communication* (E1) is quite high.

- Take-back average result is quite middling. Nevertheless, *Selective Collection* achieves remarkable results.

- On the other hand, results regarding the offering of products made from the use of recycled or renewable raw materials were quite bad. The same happened regarding the design to make products easy to separate components or materials for reuse or recycling.

4.6. Slovenia

The self-diagnosed Slovenian countries have considered themselves especially strong in terms of *Efficient production* (figure 12). On the other hand, the main weaknesses are found in the *Ecodesign* dimension and in the *Servitization* dimension.

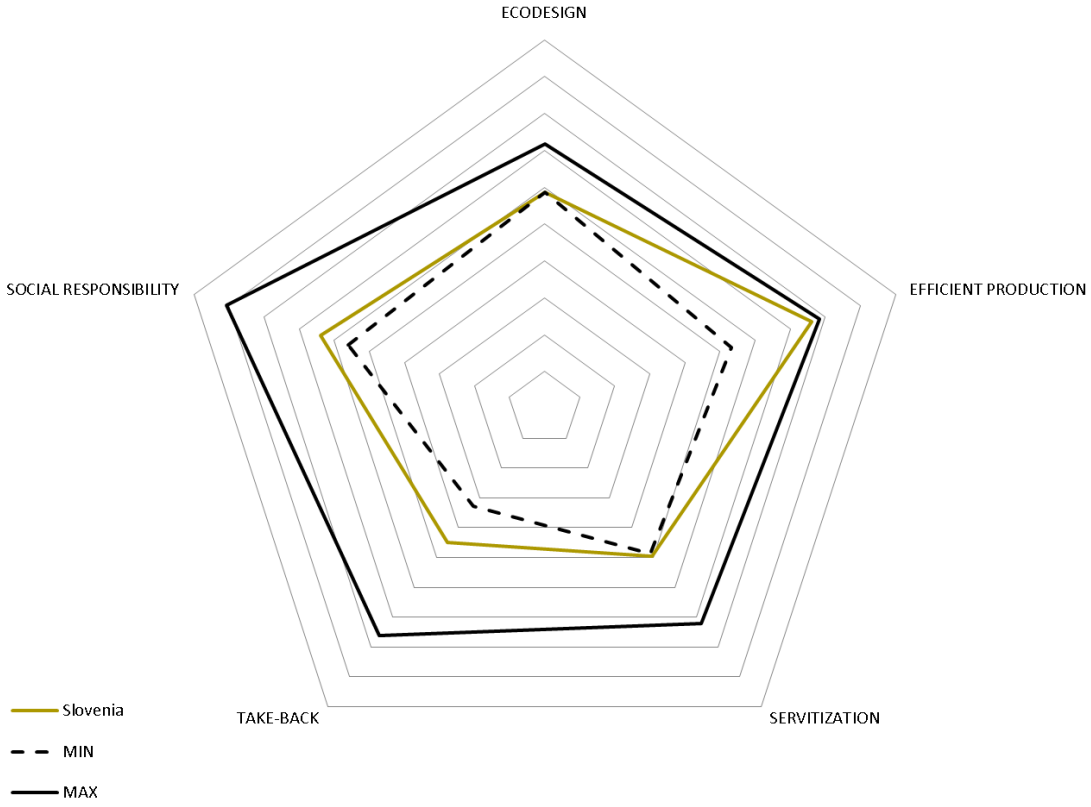


Fig. 12: Slovenian companies results

Regarding the detailed results (figure 13), some conclusions can be drawn:

- *Ecodesign* dimension gest the lowest average evaluation. This happens, mainly, because of a bad result in respect to *Product functional optimization*. However, it is remarkably high the evaluation given to *Design aimed at valuing the end of life*. This can be explained by the small size and regional character of the companies involved (since their production is near to be under demand).

- *Take-back* dimension has gotten a poor result due to the truly bad self-assess regarding *Selective collection*. As it has been said before, the lack of resources due to the small size of the companies involved in the project, can explain this result.

- *Remanufacturing* and *Efficient logistics* are truly remarkable. The local character of the businesses that participated on the project might have affected to these topics.

- *Servitization* results are quite bad, not only due to the *Pay per use* assessment (which is general to all countries, except Poland), but also because of the bad result in respect to *Data*

management and processing. On the other hand, in contrast to these results, the *User orientation/product customization* and *Extend shelf life* have achieved truly good evaluations. While this might not be a common practice in Slovenia, it happens to be usual among the companies involved in the project. Most of this companies are small shops oriented to produce the furniture and other wooden products by using entire or part of old/used wood as main material. This casuistry might explain this good results.

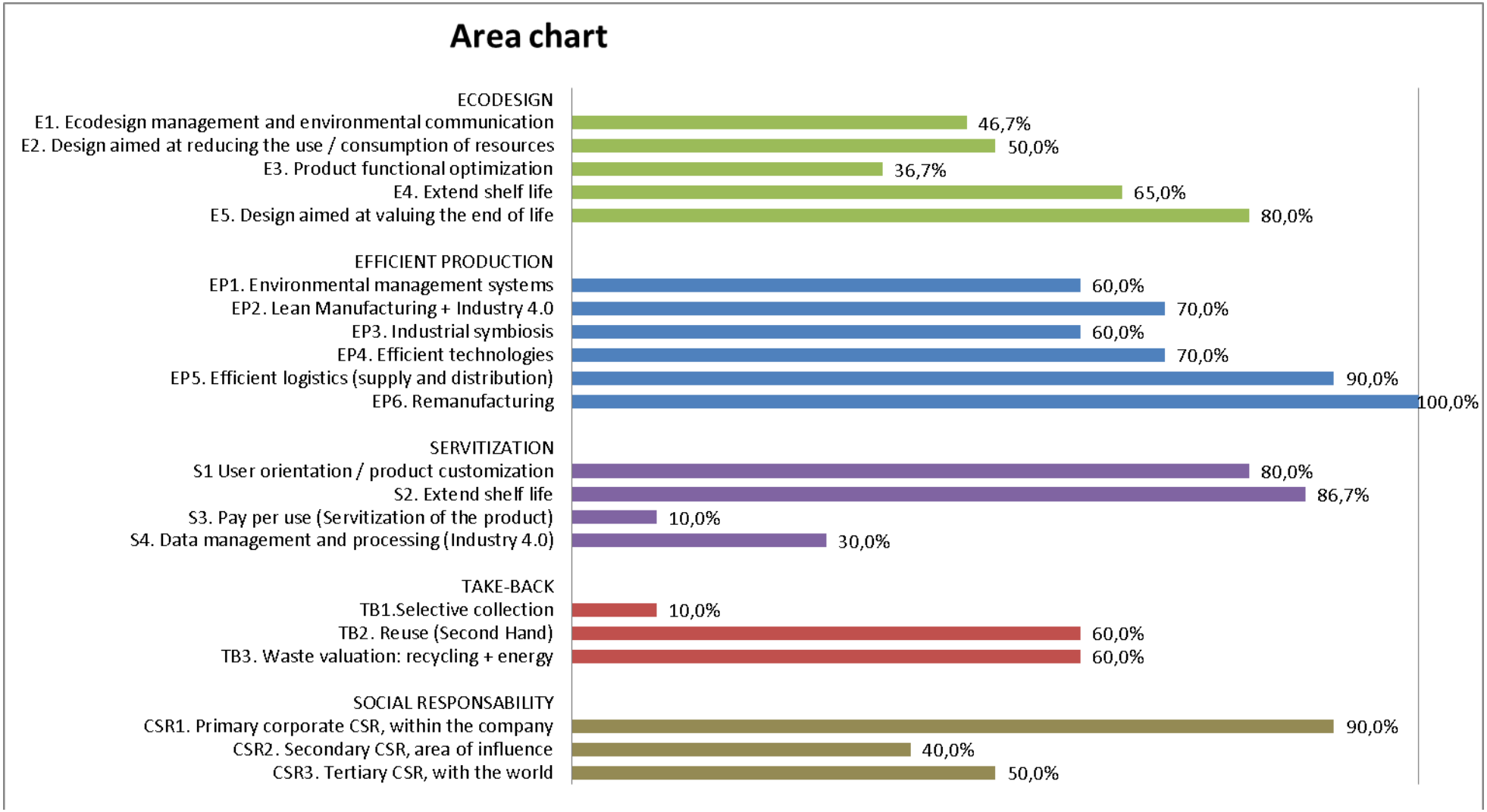


Fig. 13: Slovenian average qualifications detailed

4.7. Spain

Spanish results show non main strengths, but two weaknesses: *Take-back* and *Servitization* (figure 14).

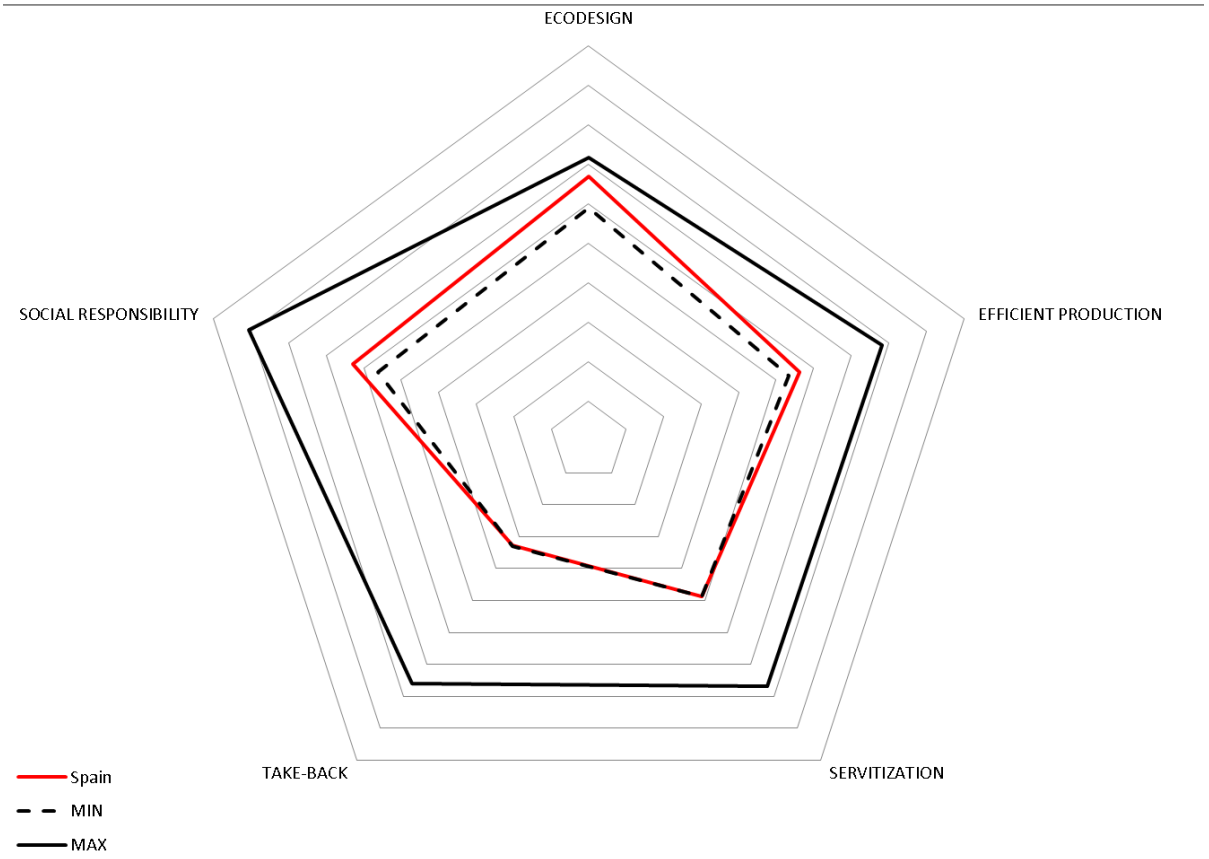


Fig. 14: Spanish companies results

As it can be seen in figure 15, *pay per use* (S3) and Industry 4.0 (S4) have gotten a bad result for all the companies that took part into the project. This implies a poor result in *Servitization* but the orientation to the user at the design step, where the result was quite positive. This result is due to the poor implementation of alternatives to the ownership at the furniture sector. This product is supposed to have a long lifespan and difficulties to transport/install the bulky furniture do not boost its replacement. Robust products are preferred to alternatives such as renting. On the other side, Insdustry 4.0 it is not implemented in the product itself or, if so, it is associated to luxury products. The exception of ICT use is the digitalization of shopping.

The bad result regarding *Efficient production*, however, is due to the poor result when evaluating most of the topics. This could be caused because most of the companies are small and do not have lot of resources to investment in equipment. There are also a low application of industrial symbiosis (with strong legal barriers) and practically no remanufacturing, but the exception of own products returned by the client before using them (damaged during transport or by the internal quality control).

Same happens with *Take-back*, which has gotten a bad result since all of the concepts evaluated have gotten bad qualifications. Spanish companies are not involved in the recovery or end of life of their products and besides they will find legal barriers to this kind of activities.

Finally, it is worth to discuss the *Ecodesign* case; while Spain is the only country in which ISO 14006 standard is certifiable, the Spanish results achieved at the topics regarding *eco-design*, *LCA methodology* and *certification according to ISO 14006 standard*, were worst then in other countries. These topics are more connected with the contract market (big buyers such as Administrations, private companies or prescribers), where the "green" public image of the client it is important and they value the contributions to environment from their providers (green procurement).

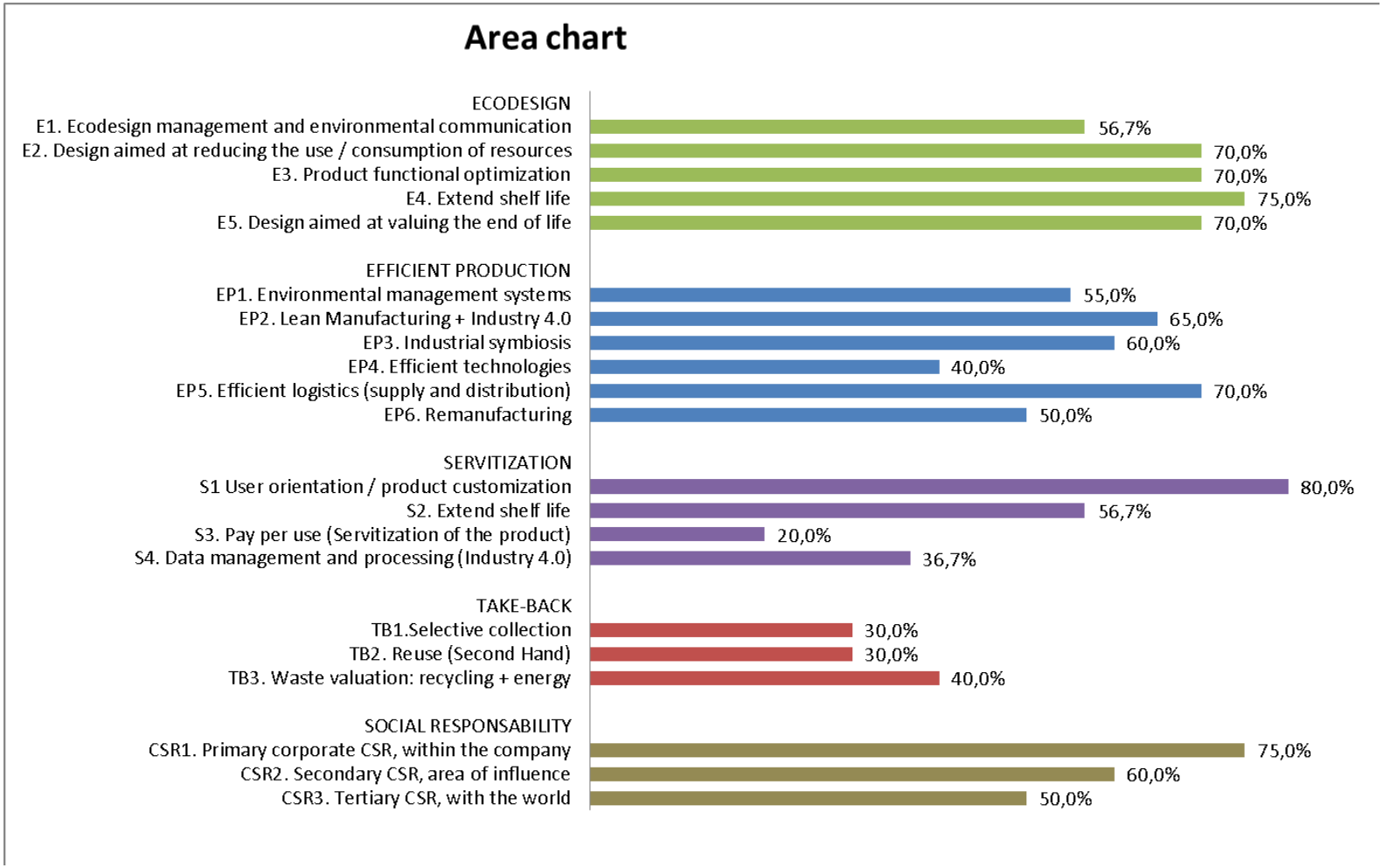


Fig. 15: Spanish average qualifications detailed

5. Manifesto results

Regarding the manifestos provided by the companies involved (table 2), these are the main conclusions:

1. There is an interest on further activities.

2. There are some differences regarding networkings or trainings in specific areas, such as "recycled materials" or "extending lifespan strategies" where the interest is on networking activities but not so much on training.

3. Main interest on training is focused on "Environmental product design and environmental assessment tools. Ecolabelling, green procurement" followed by "Production efficiency" and "Servitization" or "Corporative social responsibility".

Circular economy areas	Networking	Training
Environmental product design and environmental assessment tools. Ecolabelling, green procurement.	**19**	21
Recycled materials.	26	15
Extending the lifespan strategies.	22	16
Production efficiency	17	**19**
Industrial symbiosis	17	15
Servitisation strategies	12	**18**
Take-back strategies	17	16
Corporative social responsibility (CSR).	**18**	**18**

Table 2: Manifesto´s study

6. Conclusions

Interesting information has risen up as a consequence of the work developed during the Living Labs and the analysis of the results.

It seems clear that both economic and cultural factors affect the performance in respect to circularity.

Those companies whose market was regional in nature (both in terms of customers and suppliers), stood out for their application of terms like *Ecodesign* or *User orientation*.

However, when studying bigger companies (which markets tend to be international) strategies like Production efficiency or CSR are more common. This result is due to the fact that they have higher economic resources to invest in equipment and, on the other hand, social and environmental public image of the company happens to be very important due to market demands.

In general terms, *Ecodesign* strategies are the ones with fewer differences between countries. On the other hand, the bigger differences are found in both *Take-back* and *Servitization*. As it has been said before, cultural and legal context can explain these results.

In *Servitization* case, most of the companies are still focused only on selling products, not taking care about life-cycle steps. This might change progressively as the Extended Producer Responsibility Schemes (EPR) implementation starts to be more common in different sectors and countries.

Regarding *Take-back* strategies, high legal barriers have been found in some countries and, again, current business models do not consider (or are not prepared to) this kind of operations, or its economic benefits are not clear in current market.

To sum up, both results and subsequent analysis show a strong effect of the economic, business model, cultural and social factors over the circular economy strategies application. Taking regional environment situation into account when developing circular economy business models could be particularly important when working on a local scale.

Finally, in regards to the Manifesto results, it seems clear that there is an interest on further activities. Specially, training regarding environmental product design and environmental assessment tools and networking on recycled materials and extending the lifespan strategies.

7. Annexes

7.1. Power point provided with circular economy training material to be able to perform the self-diagnosis.

7.2. Formularies personalized according each country average self-diagnosis results, to support the conclusions.

IO1: LIVING LABS AND *"CIRCULARITY MATTERS: GAPS, LIMITS AND CONSTRAINTS IN THE EU FURNITURE INDUSTRY"*

AIDIMME

IO1: Circular economy implementation from the furniture industry perspective.

SELF-DIAGNOSTIC TOOL ON THE PERCEPTION OF CIRCULAR ECONOMY LEVEL.

NOTE to partners: Send to the companies the excel file previously to the session and open the tool at this point. Stop after each dimension to complete the related questions. Collect the excel files completed at the end of the session.

In order to make companies aware of the key concepts of the circular economy, a self-diagnosis tool is used to encourage them to enter into a cycle of continuous improvement that has worked so well in other areas such as quality or the environmental management systems.

This is achieved by obtaining a score based on the answers provided, according to the greater or lesser alignment of the company with the various Circular Economy strategies and their key concepts.

These key conceps are classified according the following explained circular economy strategies.

This score provides the company with a graph that places them in one of the 5 levels of "circularity" that have been established:

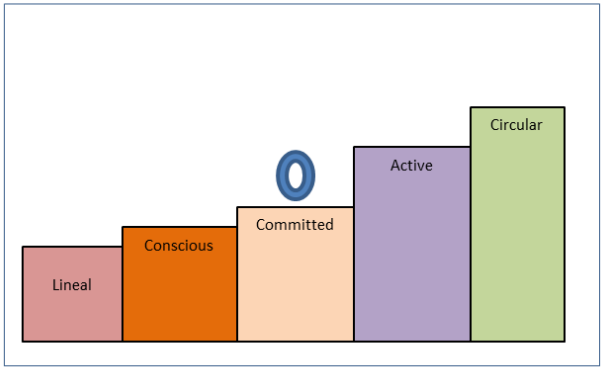
- Linear company (0-70)
- Conscious company (>71-140)
- Committed company (>140-210)
- Active company (>210-280)
- Circular company (>280)

Questionnaire for self-diagnosis of the company's level of circularity

Your score is: **48,29**

The company's level of circularity is: **Committed**

A committed company has a good understanding of the main concepts of the circular economy and works to improve its social and environmental aspects in several areas, but mainly acts in its direct area of influence. This leads it to stand out in a very specific area or to a medium level of commitment.



<- Back to the Self diagnostic

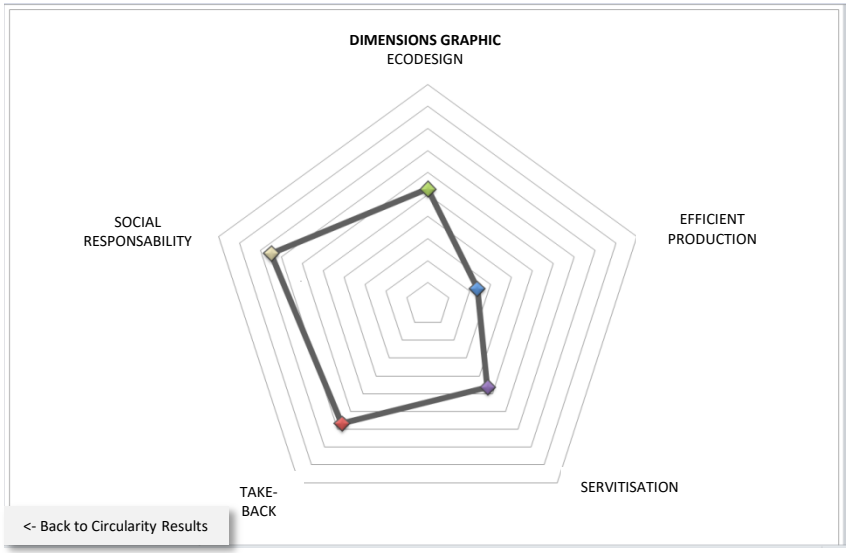
Show Dimension's Graphic->

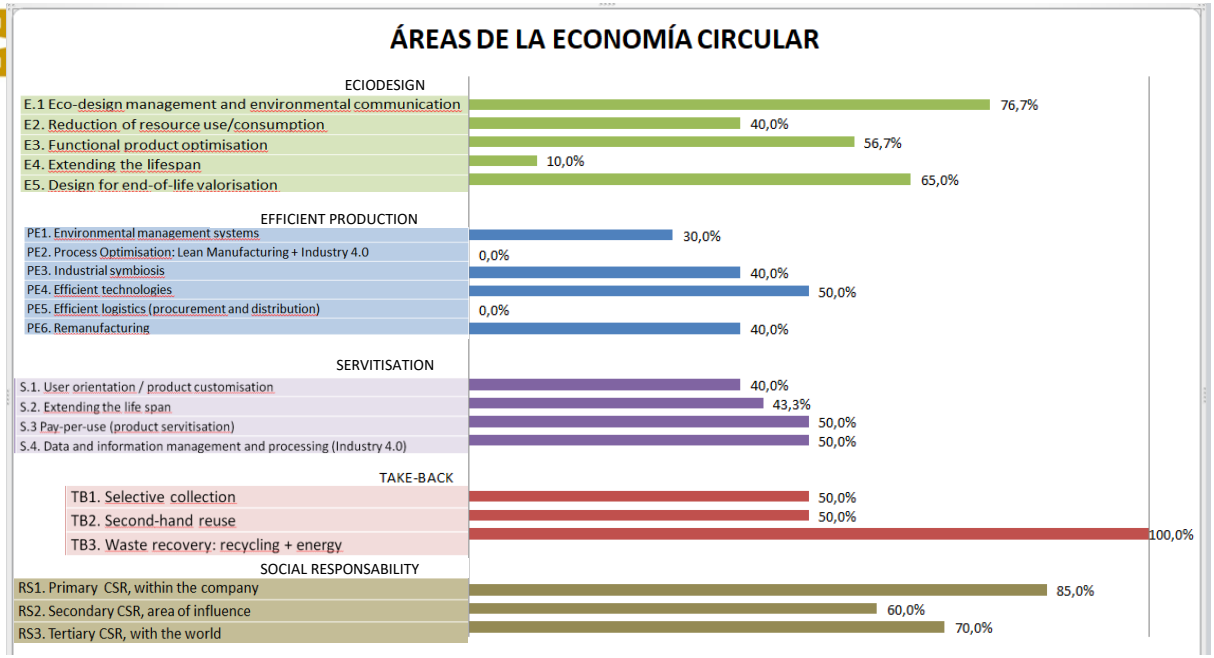
Show Area Graphic->

<- Back to the Self diagnostic

AIDIMME
METAL-PROCESSING, FURNITURE, WOOD AND PACKAGING
TECHNOLOGY INSTITUTE

This tool also allows to graphically visualize the score obtained for each dimension or for the different areas of circular economy, as they were previously structured.





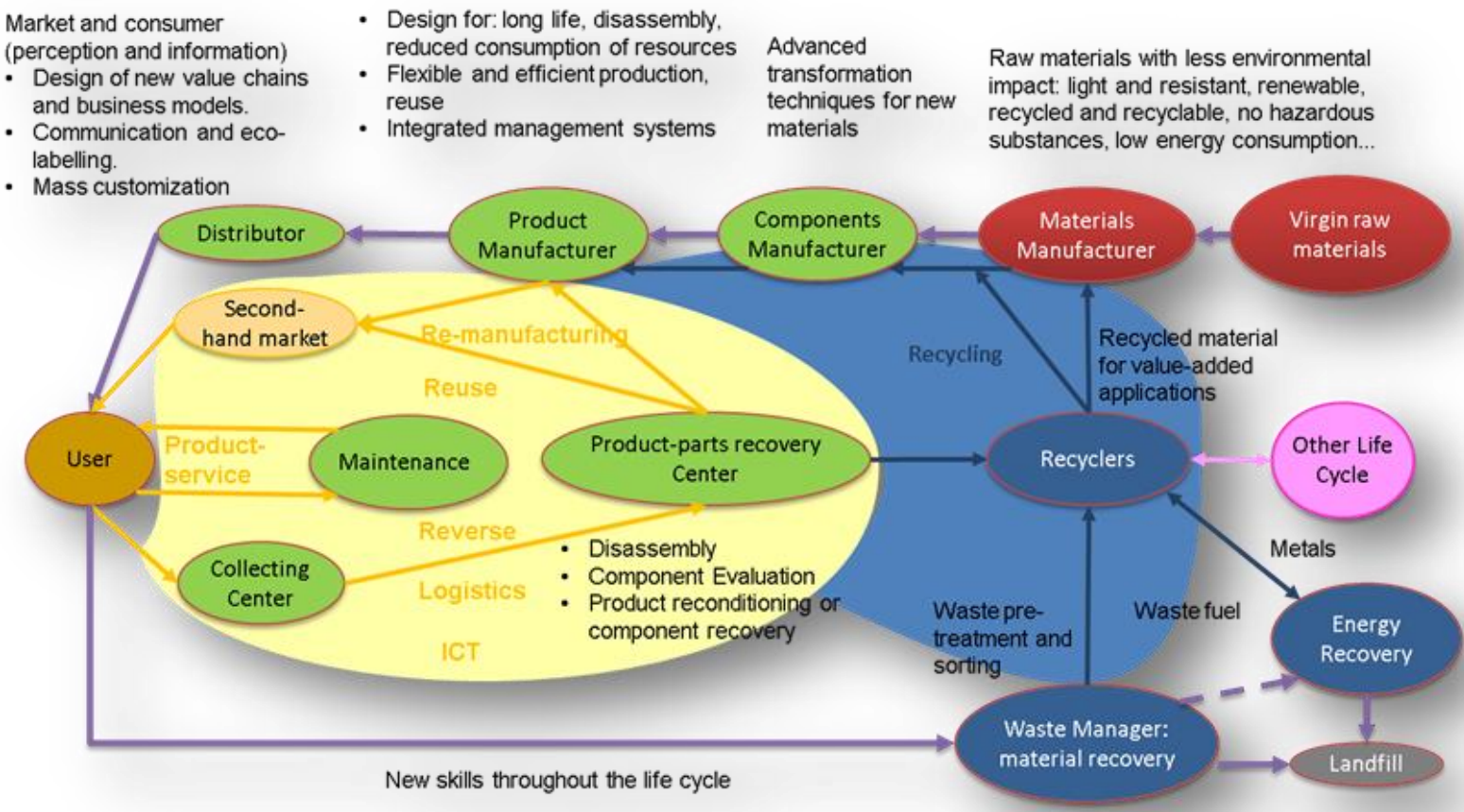
CIRCULAR ECONOMY STRATEGIES

THE CIRCULAR ECONOMY MODEL

The circular economy is an economic concept that is interrelated with sustainability, the aim of which is to keep the value of products, materials and resources (water, energy, etc.) in the economy for as long as possible and to minimize the generation of waste.

It is about implementing a new economy based on the principle of "closing the life cycle" of products, services, waste, materials, water and energy..

Sustainable consumption and production model: the circular economy



The circular economy is based on several principles:

- **Eco-design**: considers and prevents environmental impacts throughout the life cycle of a product/service from its conception.
- **Production efficiency** and **industrial symbiosis**: establishing a mode of industrial organization characterised by optimized management of stocks and flows of materials, energy and services and their collaboration with other companies to this aim.
- **Servitization**: the economy of "functionality" is favoring use over possession, the sale of a service over a good, including services to expand the use life (maintenance/repair…)
- **Take back**: finding a second life for products/components/materials
  - Reuse: reintroducing into the economic circuit those products that no longer correspond to the needs of the initial consumers.
  - Remanufacturing: reusing waste or parts of waste that can still be used to make new products.
  - Recycling: using the materials found in waste.
  - Energy Recovery: the energetic use of waste that cannot be recycled.
- **Corporative social responsibility**: including social awareness at the companies.

These changes in the product life cycle can lead to new value chains, "networking":

- Conception of new business models: transition to the product-service concept to reduce environmental impact and innovate.
- Design of new value chains (inter-sectoriality, reuse and recycling).
- Inclusion of the "social" variable: consumer behavior and involvement. Second-hand/reconditioned products market.
- Communication and traceability through ICT. IoT incorporated into smart products.
- Environmental communication: eco-labelling, public procurement...

DIMENSION	AREAS
ECODESIGN	E.1 Eco-design management and environmental communication
	E2. Reduction of resource use/consumption
	E3. Functional product optimisation
	E4. Extending the lifespan
	E5. Design for end-of-life valorisation
EFFICIENT PRODUCTION	PE1. Environmental management systems
	PE2. Process Optimisation: Lean Manufacturing + Industry 4.0
	PE3. Industrial symbiosis
	PE4. Efficient technologies
	PE5. Efficient logistics (procurement and distribution)
	PE6. Remanufacturing
SERVITISATION	S.1. User orientation / product customisation
	S.2. Extending the life span
	S.3 Pay-per-use (product servitisation)
	S.4. Data and information management and processing (Industry 4.0)
TAKE-BACK	TB1. Selective collection
	TB2. Second-hand reuse
	TB3. Waste recovery: recycling + energy
CORPORATIVE SOCIAL RESPONSABILITY	RS1. Primary CSR, within the company
	RS2. Secondary CSR, area of influence
	RS3. Tertiary CSR, with the world

Area E.1 Eco-design management and environmental communication

Ecodesign consists of the environmental improvement of the product or service in all the stages of its life cycle from its conception, considering the extraction and transformation of raw materials, production, distribution, use and its end of life as waste.

The management system according ISO 14006:2020 supports companies to implement ecodesign sistematically, while the **environmental assessment tools** (such as Life Cycle Assessment) quantify the environmental improvement achieved, and allow the further communication to interested parties by means of the different **ecolabel** types: certified labels, self-declarations or Environmental Product Declarations. Ecolabels allow consumers to be informed so that they can reduce environmental impacts through their consumption habits.

Green procurement is the introduction of environmental criteria in the procurement of goods and services. This can be done by the Administration or our clients, or by the furniture company to their providers.

To prevent the natural resources depletion, can be faced by the selection of the raw materials (recycled or renewable), or by minimising their use at the final product.

The use of **recycled materials** promotes the circular economy by avoiding the disposal of resources contained in waste and the need on new natural resources. **Renewable raw materials** (in constant or rapid reproduction or are very abundant) are therefore not likely to be depleted in the short/medium term.

To lighten the final product without compromising its mechanical and/or functional properties has also environmental benefits in distribution and end of life stages.

Finally, harmful substances has to be avoided or reduced, because their manufacturing and use can damage humans or the environment, or hinder the end of life of the product.

Area E.3 Functional product optimisation

Efficient use means avoiding early breakage and making the most of the product's functionalities, thus increasing both customer satisfaction and product lifetime. In the rare case of energy-consuming furniture, the efficient use of the product is essential to reduce its consumption during its lifetime

User-orientation means designing to meet the real needs of the user and providing value to them.

Environmentally, this implies that:

- user satisfaction is increased by increasing the useful life of the product (avoiding disposal of the product before its technological or material end),
- avoiding functions or superficial components that make the product more expensive and increase the consumption of resources and waste generation.

Area E.4 Extending the lifespan

To avoid premature product change or replacement because they become technically obsolete, because they break down or because fashion changes, it will be necessary to design:

- **Design robust** (resistant) products, but in accordance with the intensity of use to which they will be subjected.
- Design **timeless products** (not subject to changes in fashion).
- Design products that are **easy to maintain, repair or upgrade**.

Area E5. Design for end-of-life valorisation

Design for dissasembly/separability means to optimise the valorisation of the product at its end of life, considering:

- Ease of dissasembly (recovering value components that can be reused without damage).
- Design for separability: to separate the various materials for recycling in a cost-effective way, with reciclable materials, avoiding components multi-material, complex structures, etc. that can generate contamination at the final waste flow.

When recycling it is not possible, energy recovery valorisation is the last alternative to landfilling.

An ideal design is to use the minimum number of different materials, use standardized, easily accessible connections and no fixed, adhesive-based joints.

ECODESIGN QUESTIONS

Area PE1. Environmental management systems

The development and implementation of environmental management systems in the company ensures a continuous improvement in the environmental impact of its activity.

It is possible to certify these systems according to ISO 14001 or EMAS standards, which is a market recognition of the company's commitment to the environment. In general, these systems aim to reduce the environmental impact of the company and ensure evidence of its results.

This action is linked to the implementation of, among others, organisational and operational measures that make it possible to achieve optimum efficiency of the installation and prevent or reduce to technically and economically feasible levels the consumption of resources and waste flows generated in industrial processes (dumping, waste, emissions, etc.).

Area PE2. Process optimisation: Lean Manufacturing + Industry 4.0

The theory of **zero defects** consists of manufacturing products aims that all manufactured products comply with all the quality requirements demanded and designed, thus avoiding waste, energy and extra costs.

From an environmental perspective, a good **inventory management** helps to avoid wastes from expired raw materials or components/products that are out of specification due to changes in designs, etc.

Having a good **product traceability system** helps to comply with quality assurance, hygiene standards and safety in compliance with current regulations. It also provides the consumer with reliable environmental information on the materials that make up the product (recycled content or absence of hazardous substances, certifications, etc.) or even waste managers. Chain of Custody certification systems are based on this concept.

Process sensoring systems allow the acquisition of parameters of the production process, optimising its efficiency and improving the management of the company from the perspective of quality and the environment. It is also a key tool for increasing the efficiency and profitability of maintenance tasks.

From an environmental perspective, **preventive maintenance** makes it possible to avoid the generation of defective products that need to be reprocessed or discarded, oil spills, leaks or excessive consumption, and in general, when possible **technological updating** improves production efficiency.

Coworking is a way of working that allows independent professionals, entrepreneurs and SMEs from different sectors to share the same workspace (both physical and virtual) in order to develop their professional projects while promoting joint projects. This strategy (when feasible) besides other benefits, helps to share fixed costs in order to adjust to flexible production or changes in demand (for example in times of crisis or pandemic) and reduce the environmental impacts from the duplicity of infrastructures and equipment .

Area PE3. By-product platforms / Industrial symbiosis

The generation of waste flows is an inevitable consequence of industrial activity. The use of **secondary raw materials** reduces the extraction of new raw materials, avoiding pressure on natural resources, and in most cases, they implies considerable energy savings.

Industrial symbiosis is the process by which wastes or by-products of an industry or industrial process become the raw materials for another. **By-product platforms** allow to connect the offer and demand of by-products from companies.

Other option of industrial symbiosis is to establish an agreement between different companies to **share common services** of supply, distribution, etc., or treat the waste flows through **common waste management services** or purification facilities. In this case, in addition to the economic factor, the pooling of efforts makes it possible to optimise the treatment and possible reuse of these flows.

Area PE4. Efficient technologies

More efficient technologies refer to:

- **better utilization of the raw material** they are processing or applying, and
- lower consumption of energy or other consumables necessary for their operation.

In the case of the use of raw materials, we find examples helping to reduce consumption and waste generation, such as:

- cutting optimization software, which makes it possible to maximize the quantity of parts with a given geometry obtained from a standard board in order to generate the minimum amount of trimming possible;
- HVLP guns for furniture finishing, that generate less overspray (bouncing of the paint particles on the part) to achieve the same result as traditional guns.

Using more **energy efficient technologies** may imply that the engine itself is more efficient, or that the machine has higher productivity ratio or makes more operations per unit of energy consumed. The origin of the energy used also influences the resulting environmental impact, and priority should be given to **renewable energies**.

Area PE5. Efficient logistics (supply)

Reliable suppliers contribute to the stability of the value chain (generating a positive effect on the stability of employment and solvency of those involved) and has direct benefits for the efficient production of the company (deliveries, quality of raw materials, reduction of stocks…).

Besides if the providers are local, the environmental impact of the transport is reduced, and contributes to the economical empowerment of the region.

Area PE5. Efficient logistics (distribution)

Efficient logistics are those that ensure that products reach their destination while consuming the least amount of fuel and therefore reducing pollution derived from combustion emissions, using fewer working hours, etc.

Efficient transport procedures accompanied by good planning and management practices, are key to achieve to optimize **distribution routes** and to optimize **vehicle loading**. This second aim can be improved from the product (sending the product unassembled or in a nestable design)and its packaging design. Transport by specialized agencies makes it possible to avoid empty return transports.

The selection of the **type of vehicle** also affects the environmental impact of transport, increasing by ton of good and km transported following this sequence: ship, train, truck and plane. The combustion efficiency or the fuel used are affecting the final impact.

Area PE6. Remanufacturing

Remanufacturing is a rigorous and comprehensive industrial process by which a product or component is returned to its original condition using a combination of used, repaired or new parts, and its function and quality is assured. Remanufacturing may involve the repair or replacement of worn or obsolete parts. Typical products that are remanufactured include: electrical and electronic equipment, printers, furniture, engines, etc.

Remanufacturing is more than repairing the product, as it offers the same warranties as an original product, but has lower costs than if it were new.

When remanufacturing is carried out on defective products (non- used products) that have not been offered for sale or have been returned by the customer, it is usually an occasional activity of the company. When the product is recovered at its end of life, it is a main activity of the company with important reverse logistics implications that must be carefully planned.

In any case from the environmental perspective, remanufacturing reduces new natural resources consume and waste generation.

EFFICIENT PRODUCTION QUESTIONS

Area S1. S1.User orientation / product customisation

User-oriented design strategies seek to extend the useful life of the product by increasing the user's satisfaction with the product. In this case, customization adds value to the product by adapting the basic design to the user's needs from a functional perspective, or even from an aesthetic perspective.

Customization can be limited, based on a series of predetermined options or it can follow the user's requirements. Another user-oriented design option involve the users into the design process by studying and considering their real needs (design thinking).

Area S2. Services to extend service life

Offering **services in addition to the sale of the product** can achieve greater user satisfaction and optimization of product use. This also represents a great opportunity for customer loyalty with the manufacturer's brand, as well as a new source of revenue from the provision of such services.

An **extended warranty period** encourages the customer to demand the repair of the product during this period, rather than discarding the product. It can be included in the price or it can be an additional service to pay for. This strategy implies a post-sales and repairing infrastructure or the assurance of spare parts for a long period.

Other after-sales services, can be to **advice and troubleshooting**, achieving higher user satisfaction and optimization of product use. One of the main services is a **periodic maintenance**, or **updating the product** to technological innovations, providing it with additional functions, etc.

Beyond the maintenance service, **the repair service (**outsourced in many cases) involves a professional analysing and repairing a product that, if not fixed, will become waste.

Area S.3 Pay-per-use (product servitisation)

The functional economy prioritizes the use of the product as opposed to its ownership. This represents a paradigm shift in that it privileges the sale of a service over a good and a change in the company's business model.

This makes it possible to optimize the useful life of the product, sometimes reducing the number of units that are manufactured and discarded, and to provide new sources of income for companies while improving customer satisfaction.

Besides the product-oriented servicespreviously explained, there are different levels of supply between the pure sale of a product and the pure sale of a service, which are called product-service systems:

- Use-oriented services: rental of the product, shared use...
- Result oriented services: the charge is based on the service provided by the product, without owning or renting the product.

Area S4. Data and Information Management and Processing (Industry 4.0)

Industry 4.0 and the digitalisation of information allow new forms of interaction with the user for a wide variety of purposes, but which can lead to savings in the consumption of physical resources and the consequent generation of waste:

- Contact forms, invoices, or advertising.
- Online product sales.
- Product or component traceability: this can be applied to repairs, spare parts or monitoring the satisfaction and durability of certain models.

Sensorise and the Internet of Things (IoT) in the furniture sector opens up a wide variety of additional services during the use of products: self-diagnosis and warning of faults, warning of incorrect use (for example in terms of ergonomics) and collection of real data that is very interesting for the manufacturer. But it has additional environmental negative effects (energy demand, end of life as WEE).

Product shared use has become very common as an economic alternative in certain sectors such as transport, or in certain household appliances (such as washing machines), generating new business models and **platforms** to manage such sharing. This strategy is closely linked to pay-per-use, but focuses on the virtual management of resources.

SERVITISATION QUESTIONS

Area TB1.Separate collection

The treatment at the **end of life of products** can be optimised if their particular conditions are addressed in a **planned** manner (training of workers, appropriate tools and facilities), which also allows for economies of scale, and even facilitates remanufacturing processes.

This implies **selective collection** of a product typology and preventing them from swelling the bulky household waste stream.

This can be achieved through **user incentives** (discount on the purchase of a new product from the same company or ease of disposal, promoting donations for social purposes, etc.) for the return of a product through a certain channel.

The manufacturing company can limit itself to the management of the incentive, creating alliances with other entities for the logistical management and treatment of the collected product, or take charge of the entire operation, especially if the aim is to make use of the components or materials, or their reconditioning for resale.

Area TB2. Reuse (Second Hand)

The concept of **reuse** implies that the product does NOT have the status of waste, and is therefore considered as a life extension strategy. The market for second-hand products is closely related to household furniture between individuals, and several platforms facilitate the display and sale of these products but it is also applied at the contract sector as a business model.

In this second case, there are a series of stages for diagnosing the state of the product (for its acceptance and establishing its price) and, if possible, its reconditioning.

Manufacturing companies can encourage reconditioning operations from the conception of the product, through a design to facilitate disassembly (modular, reducing the variety of materials and seeking structural simplicity, etc.).

Área TB3. Waste recovery: recycling + energy

The end-of-life of waste can be improved with proper **management information to the use**r, especially if there is a separate collection option.

The **traceability of waste** and the analysis of material flows can provide key information to administrations for the planning of treatment facilities, or in extreme cases of wood treated with certain biocides (which may be currently prohibited), to avoid its reuse or recycling.

Likewise, a good **control of management processes** can contribute to obtaining better qualities in the recovered materials/components, which enhances their subsequent reintroduction into the production system.

Área TB3.Waste recovery: recycling + energy

The waste hierarchy establishes the following prioritisation in relation to the treatment of waste :

Except for prevention, all other operations must be carried out by an authorised waste manager so many manufacturing companies have registered as waste managers in order to be able to carry out some of these operations.

Preparation for re-use is the recovery operation consisting of testing, cleaning or repair, whereby products or components of products that have become waste are prepared so that they can be re-used without any prior processing**.** The following preference is the recovery of constituent materials by **recycling** operations, and when this is not possible, it should be ensured their **energy valorisation** which is the primary use of the waste as a fuel or other means of producing energy.

TAKE-BACK QUESTIONS

Área RS1. Primary corporate CSR, within the company

This area aims to ensure the best working conditions, beyond legislative compliance. The following items will contribute to staff satisfaction and to improve their productivity, to having highly qualified staff and retaining talent, as well as promoting innovation and finally improve the competitiveness of the company.

- Working conditions: **health and safety** (machinery, installations and operations), exposure levels to chemicals, noise, etc.
- Continuous **training and career plan**. **Stability of employment** policies. They contribute to personal and professional development.
- Good **internal communication and no-discrimination** (code of ethical conduct, remuneration balance, equality plan, recruitment of people at risk of social exclusion), fosters a good working environment.
- A **additional social and economic benefits** to the workers, such us measures of conciliation with the familiar life and promotion of work flexibility.
- **Strengthening the local economy** (support to local suppliers and distributors).

Área RS2. Secondary corporate CSR, area of influence

Companies are in continuous interaction with the environment in which they are located. There are companies that contribute to the improvement of the local environment in which they are located (environmentally, socially and/or economically).

- Some of them consider **social goals** at their statutes. It is important to communicate to our stakeholders the values of our organisation (**sustainability report**).
- **Safety and health of the products/services offered.** They can be considered and ensured beyond the legal compliance, such as those with those companies that invest in testing and certification , or designing furniture to improve the health of the user.
- **Aid groups of users with special needs,** by ease of payment, or designing considering special functional needs (elder people, reduced mobility, etc).
- It can also be extended the RSC by the **selection of suppliers and collaborators based on their CSR and environmental practices.**

Area RS3. Tertiary Corporate CSR, with the world

Companies can subscribe or endorse statutes, principles and other documents of an economic, environmental and social nature developed externally. For example, they can support "The 10 Principles of the Global Compact" and with it the Sustainable Development Goals (SDG).

They can also participate in campaigns to support specific social or environmental actions, either:

- Financial support through donations, which can be independent or by involving the consumer and donating a percentage of the sales obtained.
- Support in the form of awareness campaigns, both internal to the company and to the consumer or other interested parties, associating the brand with a specific cause.

CORPORATIVE SOCIAL RESPONSIBILITY QUESTIONS

AIDIMME

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Greek average results

E1. Ecodesign management and environmental communication	**5,72**
Design and product assessment (LCA) from environmental and produtct life-cycle perspective. ISO 14006 certification.	1,00
Environmental requirements to providers	7,50
Environmental infortmation to customers.	8,67
E2. Design aimed at reducing the use / consumption of resources	**8,75**
Use of recycled orrenewable materials.	7,67
Design products to minimize the use of resources	**9,83**
E3. Product functional optimization	**6,50**
Products are efficient in use.	6,67
Market studies to identify the real needs of the users.	7,83
Information to the user to improve product performanceor use experience.	5,00
E4. Extend use life	**3,42**
Design durable products with easy maintenance	5,83
Modularity and repairability (replacement parts)	1,00
E5. Design aimed at valorisation at the end of life	**7,42**
Design for dissassembly	7,17
Use recyclable materials.	7,67
ECODESIGN	**6,36**

EP1. Environmental management systems	**4,58**
Fulfilment of environmental legislation.	8,17
From production environmental improvement to environmental management system (certified ISO14001 or EMAS).	1,00
EP2. Lean Manufacturing + Industry 4.0	**7,25**
Technologies to improve production efficiency (Lean Manufacturing + Industry 4.0).	5,83
Active collaboration/ flow of information at the value chain.	8,67
EP3. Industrial symbiosis	
Application of industrial symbiosis	**9,00**
EP4. Efficient technologies	
Efficient technologies (use of raw materials and energy consumption) + energy from renewable sources.	**9,00**
EP5. Efficient logistics (supply and distribution)	
Near suppliers and distribution logistics optimization.	**7,67**
EP6. Remanufacturing	
Infrastructure and incomes from the repair, reprocessing and manufacture of new products with raw materials recovered from recovered components/products.	**7,67**
EFFICIENT PRODUCTION	**7,53**

S1 User orientation / product customization	
User customization.	8,33
S2. Extend lifespan	**5,83**
Free extended warranty or low-cost maintenance.	1,00
Products can be upgraded to extend their useful life.	7,83
Company offers maintenance and / or repair services for the product.	8,67
S3. Pay per use (Servitization of the product)	
Possibility to use the product without buying it (have its property)	**1,00**
S4. Data management and processing (Industry 4.0)	**8,50**
Virtual communication channels with the user.	8,83
Use of IoT, sensors, smart labels, etc., at the product.	7,83
Management of product sharing platform.	8,83
SERVITIZATION	**5,92**

TB1.Selective collection	
To encourages the user and facilitate the collection of their used products obtaining income with them.	**7,83**
TB2. Reuse (Second Hand)	
Active participation at the second hand market.	**7,00**
TB3. Waste valuation: recycling + energy	
Active waste management (recycling or energy valorisation operations) of its own waste or discarded products.	**8,00**
TAKE-BACK	**7,61**

CSR1. Primary corporate CSR, within the company	**8,83**
Working conditions of staff (safety, health and training).	**9,00**
Equity, code of ethical conduct, conciliation measures and additional social benefits.	**8,67**
CSR2. Secondary CSR, area of influence	
Actions of a social nature throughout its value chain or local region.	**6,67**
CSR3. Tertiary CSR, with the world	
Alignment and promotion of social values and financially support to projects with social and / or environmental aim (worldwide).	**6,67**
SOCIAL RESPONSABILITY	**7,39**

COMPANIES DESCRIPTION:

Please, briefly describe the general characteristics of the enterprises interviewed (size, business, context...).

STRENGHTS COMMENTARY:

Regarding environmental benefits communication, Greek results have been remarkable. Is this a common practice among Greek furniture companies? Could you indicate which kind of environmental communication is provided?

Regarding the use of recycled/renewable raw materials and the minimization of resources use, Greek results have been very positive. There are any specific reason/incentive/obligation (from markets, legislation, etc.) that might have influenced on these results?

Greek results when self-diagnosing 'Servitisation: Industry 4.0' implementation (Data management and processing) are above average. Would you be able to detail some of the innovations implemented, specially regarding IoT implementation and product sharing platforms? Is this common among Greek furniture companies?

Greek self-diagnose regarding 'Take-back' is the best that have been registered. There are any enablers, boosting factors (cultural, legislative, economic…) that might have affected positively to Greek furniture companies to be proactive and to develop activities regarding…..? Could you put some examples of these activities?

'Selective collection':

'Reuse (second hand)´

'Waste valorization

WEAKNESSES COMMENTARY:

Greek average result regarding eco-design, LCA methodology and certification according to ISO 14006 standard is quite poor. Would you be able to explain why eco-design and environmental assessments are not relevant for Greek furniture companies?

None of the Greek companies evaluated designs modular products with accessible and reversible joints to facilitate both the update and the repair of the product, having replacement parts at a competitive price for a reasonable period. Please, briefly comment this results, trying to find an explanation to it based on your experience (technical, cultural, contextual, etc.).

Italian average results

E1. Ecodesign management and environmental communication	**7,50**
Design and product assessment (LCA) from environmental and product life-cycle perspective. ISO 14006 certification.	7,33
Environmental requirements to providers	6,83
Environmental information to customers.	8,33
E2. Design aimed at reducing the use / consumption of resources	**7,08**
Use of recycled or renewable materials.	7,33
Design products to minimize the use of resources	6,83
E3. Product functional optimization	**6,39**
Products are efficient in use.	7,17
Market studies to identify the real needs of the users.	5,33
Information to the user to improve product performance or use experience.	6,67
E4. Extend use life	**7,42**
Design durable products with easy maintenance	7,17
Modularity and reparability (replacement parts)	7,67
E5. Design aimed at valorisation at the end of life	**7,50**
Design for disassembly	7,17
Use recyclable materials.	7,83
ECODESIGN	**7,18**

EP1. Environmental management systems	**8,83**
Fulfilment of environmental legislation.	9,00
From production environmental improvement to environmental management system (certified ISO14001 or EMAS).	8,67
EP2. Lean Manufacturing + Industry 4.0	**8,50**
Technologies to improve production efficiency (Lean Manufacturing + Industry 4.0).	8,50
Active collaboration/ flow of information at the value chain.	8,50
EP3. Industrial symbiosis	
Application of industrial symbiosis	**7,50**
EP4. Efficient technologies	
Efficient technologies (use of raw materials and energy consumption) + energy from renewable sources.	**9,00**
EP5. Efficient logistics (supply and distribution)	
Near suppliers and distribution logistics optimization.	**8,33**
EP6. Remanufacturing	
Infrastructure and incomes from the repair, reprocessing and manufacture of new products with raw materials recovered from recovered components/products.	**4,83**
EFFICIENT PRODUCTION	**7,83**

S1 User orientation / product customization	
User customization.	9,50
S2. Extend lifespan	**7,17**
Free extended warranty or low-cost maintenance.	6,33
Products can be upgraded to extend their useful life.	7,00
Company offers maintenance and / or repair services for the product.	8,17
S3. Pay per use (Servitization of the product)	
Possibility to use the product without buying it (have its property)	2,67
S4. Data management and processing (Industry 4.0)	**6,44**
Virtual communication channels with the user.	8,17
Use of IoT, sensors, smart labels, etc., at the product.	6,17
Management of product sharing platform.	5,00
SERVITIZATION	**6,44**

TB1.Selective collection	
To encourages the user and facilitate the collection of their used products obtaining income with them.	3,50
TB2. Reuse (Second Hand)	
Active participation at the second hand market.	3,17
TB3. Waste valuation: recycling + energy	
Active waste management (recycling or energy valorisation operations) of its own waste or discarded products.	6,00
TAKE-BACK	**4,22**

CSR1. Primary corporate CSR, within the company	9,67
Working conditions of staff (safety, health and training).	9,83
Equity, code of ethical conduct, conciliation measures and additional social benefits.	9,50
CSR2. Secondary CSR, area of influence	
Actions of a social nature throughout its value chain or local region.	8,83
CSR3. Tertiary CSR, with the world	
Alignment and promotion of social values and financially support to projects with social and / or environmental aim (worldwide).	8,67
SOCIAL RESPONSABILITY	9,06

COMPANIES DESCRIPTION:

Please, briefly describe the general characteristics of the enterprises interviewed (size, business, context...).

STRENGHTS COMMENTARY:

Italian average result regarding eco-design, LCA methodology and certification according to ISO 14006 standard is very positive. Would you be able to explain why eco-design and environmental assessments are so relevant for Italian furniture companies? On the other hand, one of the companies stands out from the rest; which can be the main differences between this company and the others? As far as we know ISO 14006 it is only certified in Spain. Could you confirm this regarding Italy. It could help to explain the high values perceived by companies.

Italian companies self-diagnose achieved very good results in respect to Social Responsibility (especially in secondary and tertiary responsibility). Please, briefly comment this result. Would you be able to detail some of the actions carried out by this companies (in both secondary and tertiary responsibility)?

WEAKNESSES COMMENTARY:

Assessed Italian companies got a poor result regarding waste valuation (recycling + energy). Do you believe there is any specific barrier for the companies that might have influenced on this result?

Dutch average results

E1. Ecodesign management and environmental communication	**5,67**
Design and product assessment (LCA) from environmental and product life-cycle perspective. ISO 14006 certification.	3,50
Environmental requirements to providers	5,67
Environmental information to customers.	7,83
E2. Design aimed at reducing the use / consumption of resources	**6,25**
Use of recycled or renewable materials.	5,33
Design products to minimize the use of resources	7,17
E3. Product functional optimization	**5,11**
Products are efficient in use.	6,17
Market studies to identify the real needs of the users.	5,17
Information to the user to improve product performance or use experience.	4,00
E4. Extend use life	**8,42**
Design durable products with easy maintenance	8,67
Modularity and reparability (replacement parts)	8,17
E5. Design aimed at valorisation at the end of life	**6,42**
Design for disassembly	6,17
Use recyclable materials.	6,67
ECODESIGN	**6,37**

EP1. Environmental management systems	**5,17**
Fulfilment of environmental legislation.	6,33
From production environmental improvement to environmental management system (certified ISO14001 or EMAS).	4,00
EP2. Lean Manufacturing + Industry 4.0	**5,83**
Technologies to improve production efficiency (Lean Manufacturing + Industry 4.0).	6,00
Active collaboration/ flow of information at the value chain.	5,67
EP3. Industrial symbiosis	
Application of industrial symbiosis	**6,00**
EP4. Efficient technologies	
Efficient technologies (use of raw materials and energy consumption) + energy from renewable sources.	**5,33**
EP5. Efficient logistics (supply and distribution)	
Near suppliers and distribution logistics optimization.	**5,17**
EP6. Remanufacturing	
Infrastructure and incomes from the repair, reprocessing and manufacture of new products with raw materials recovered from recovered components/products.	**4,50**
EFFICIENT PRODUCTION	**5,33**

S1 User orientation / product customization	
User customization.	8,83
S2. Extend lifespan	**8,50**
Free extended warranty or low-cost maintenance.	9,00
Products can be upgraded to extend their useful life.	8,50
Company offers maintenance and / or repair services for the product.	8,00
S3. Pay per use (Servitization of the product)	
Possibility to use the product without buying it (have its property)	**1,33**
S4. Data management and processing (Industry 4.0)	**5,50**
Virtual communication channels with the user.	8,00
Use of IoT, sensors, smart labels, etc., at the product.	3,67
Management of product sharing platform.	4,83
SERVITIZATION	**6,04**

TB1.Selective collection	
To encourages the user and facilitate the collection of their used products obtaining income with them.	**4,33**
TB2. Reuse (Second Hand)	
Active participation at the second hand market.	**6,33**
TB3. Waste valuation: recycling + energy	
Active waste management (recycling or energy valorisation operations) of its own waste or discarded products.	**6,67**
TAKE-BACK	**5,78**

CSR1. Primary corporate CSR, within the company	7,17
Working conditions of staff (safety, health and training).	7,33
Equity, code of ethical conduct, conciliation measures and additional social benefits.	7,00
CSR2. Secondary CSR, area of influence	
Actions of a social nature throughout its value chain or local region.	**6,67**
CSR3. Tertiary CSR, with the world	
Alignment and promotion of social values and financially support to projects with social and / or environmental aim (worldwide).	**3,00**
SOCIAL RESPONSABILITY	**5,61**

COMPANIES DESCRIPTION:

Please, briefly describe the general characteristics of the enterprises interviewed (size, business, context...).

STRENGHTS COMMENTARY:

Dutch results regarding both durability and modular products design were over average. Please, briefly comment these results, trying to find an explanation to it based on your experience (technical, cultural, contextual, etc.).

Dutch companies assessed showed very good results regarding customization of the product. Which kind of adaptation or customization services is usually offered? Is this kind of service common in Dutch furniture industry?

The result regarding to secondary social responsibility achieved by Dutch companies was really good. Would you be able to give some examples of actions carried out on this behalf? Is it common among Dutch furniture companies?

General comments:

This is the most balanced profile from the six countries, with no special weakness or strengths (except the previous ones). Please add any consideration that could explain the obtained results based on specific characteristics of Dutch companies, market, cultural factors, etc. (for example the comment you made regarding the lack of raw material manufacturers).

Poland average results

E1. Ecodesign management and environmental communication	**8,28**
Design and product assessment (LCA) from environmental and product life-cycle perspective. ISO 14006 certification.	**7,83**
Environmental requirements to providers	**8,83**
Environmental information to customers.	**8,17**
E2. Design aimed at reducing the use / consumption of resources	**4,17**
Use of recycled or renewable materials.	**3,00**
Design products to minimize the use of resources	**5,33**
E3. Product functional optimization	**5,50**
Products are efficient in use.	**5,50**
Market studies to identify the real needs of the users.	**6,67**
Information to the user to improve product performance or use experience.	**4,33**
E4. Extend use life	**6,75**
Design durable products with easy maintenance	**7,83**
Modularity and reparability (replacement parts)	**5,67**
E5. Design aimed at valorisation at the end of life	**4,83**
Design for disassembly	**3,17**
Use recyclable materials.	**6,50**
ECODESIGN	**5,91**

EP1. Environmental management systems	**8,08**
Fulfilment of environmental legislation.	9,17
From production environmental improvement to environmental management system (certified ISO14001 or EMAS).	7,00
EP2. Lean Manufacturing + Industry 4.0	**7,00**
Technologies to improve production efficiency (Lean Manufacturing + Industry 4.0).	6,17
Active collaboration/ flow of information at the value chain.	7,83
EP3. Industrial symbiosis	
Application of industrial symbiosis	**5,83**
EP4. Efficient technologies	
Efficient technologies (use of raw materials and energy consumption) + energy from renewable sources.	**6,50**
EP5. Efficient logistics (supply and distribution)	
Near suppliers and distribution logistics optimization.	**6,50**
EP6. Remanufacturing	
Infrastructure and incomes from the repair, reprocessing and manufacture of new products with raw materials recovered from recovered components/products.	**7,50**
EFFICIENT PRODUCTION	**6,90**

S1 User orientation / product customization	
User customization.	5,83
S2. Extend lifespan	**8,83**
Free extended warranty or low-cost maintenance.	8,33
Products can be upgraded to extend their useful life.	9,67
Company offers maintenance and / or repair services for the product.	8,50
S3. Pay per use (Servitization of the product)	
Possibility to use the product without buying it (have its property)	**6,67**
S4. Data management and processing (Industry 4.0)	**7,56**
Virtual communication channels with the user.	7,67
Use of IoT, sensors, smart labels, etc., at the product.	8,00
Management of product sharing platform.	7,00
SERVITIZATION	**7,22**

TB1.Selective collection	
To encourages the user and facilitate the collection of their used products obtaining income with them.	**6,83**
TB2. Reuse (Second Hand)	
Active participation at the second hand market.	**4,00**
TB3. Waste valuation: recycling + energy	
Active waste management (recycling or energy valorisation operations) of its own waste or discarded products.	**5,67**
TAKE-BACK	**5,50**

CSR1. Primary corporate CSR, within the company	**9,08**
Working conditions of staff (safety, health and training).	**9,33**
Equity, code of ethical conduct, conciliation measures and additional social benefits.	**8,83**
CSR2. Secondary CSR, area of influence	
Actions of a social nature throughout its value chain or local region.	**7,50**
CSR3. Tertiary CSR, with the world	
Alignment and promotion of social values and financially support to projects with social and / or environmental aim (worldwide).	**7,17**
SOCIAL RESPONSABILITY	**7,92**

COMPANIES DESCRIPTION:

Please, briefly describe the general characteristics of the enterprises interviewed (size, business, context...).

STRENGHTS COMMENTARY:

Polish companies self-assessed with an over average grades regarding Eco-design management and environmental communication. Would you be able to explain why eco-design and environmental communication are so relevant and with this high implementation at Polish furniture companies? Some of the companies self-assess with the maximum value but as far as we know, ISO 14006 is only certified in Spain. Could you confirm this regarding Poland?.

Polish results regarding designing to the extension of the products shelf life were remarkably good. Please, briefly comment these results, trying to find an explanation to it based on your experience (technical, cultural, contextual, etc.).

Polish companies are the only ones (from the six countries) with a positive result regarding 'pay per use'. In fact, the result achieved was truly good. Would you be able to explain this result? Which might be the main factors that have facilitated it?

Polish assessment regarding Servitization: 'Industry 4.0' (Data management and processing) was over average. Would you be able to detail some of the Industry 4.0 related innovations carried out by the Polish furniture industry? Do you believe this is common in Polish furniture industry, or is it a distinctive characteristic of the diagnosed companies?

Polish companies achieved good results regarding promoting or performing selective collection. Do you believe there is any specific reason or boosting factor (market, legislation, etc.) for the companies that might have influenced on this result? Is it common in Polish furniture industry?

Polish companies achieved very good results in respect to Social Responsibility (especially in secondary and tertiary responsibility). Please, briefly comment this result. Would you be able to detail some of the actions carried out by this companies (in both secondary and tertiary responsibility)?

WEAKNESSES COMMENTARY:

Polish results regarding the offering of products made from the use of recycled or renewable raw materials were bad. Do you believe there is any specific barrier (market, suitability of raw material, etc.) for the companies that might have influenced on this result?

Polish companies self-diagnosed badly regarding the design to make products easy to separate components or materials for reuse or recycling. However, one of the companies evaluated itself with a '10'. Which could be what differentiates this company from the others? Which could be the main barrier for the rest of the companies on this regard?

Slovenian average results

E1. Ecodesign management and environmental communication	**4,61**
Design and product assessment (LCA) from environmental and product life-cycle perspective. ISO 14006 certification.	**3,67**
Environmental requirements to providers	**6,50**
Environmental information to customers.	**3,67**
E2. Design aimed at reducing the use / consumption of resources	**5,42**
Use of recycled or renewable materials.	**5,33**
Design products to minimize the use of resources	**5,50**
E3. Product functional optimization	**4,42**
Products are efficient in use.	**4,00**
Market studies to identify the real needs of the users.	**4,83**
Information to the user to improve product performance or use experience.	**1,83**
E4. Extend use life	**6,33**
Design durable products with easy maintenance	**5,67**
Modularity and reparability (replacement parts)	**7,00**
E5. Design aimed at valorisation at the end of life	**8,50**
Design for disassembly	**8,50**
Use recyclable materials.	**8,50**
ECODESIGN	**5,86**

EP1. Environmental management systems	**6,25**
Fulfilment of environmental legislation.	10,00
From production environmental improvement to environmental management system (certified ISO14001 or EMAS).	2,50
EP2. Lean Manufacturing + Industry 4.0	**7,08**
Technologies to improve production efficiency (Lean Manufacturing + Industry 4.0).	4,83
Active collaboration/ flow of information at the value chain.	9,33
EP3. Industrial symbiosis	
Application of industrial symbiosis	6,17
EP4. Efficient technologies	
Efficient technologies (use of raw materials and energy consumption) + energy from renewable sources.	7,33
EP5. Efficient logistics (supply and distribution)	
Near suppliers and distribution logistics optimization.	9,17
EP6. Remanufacturing	
Infrastructure and incomes from the repair, reprocessing and manufacture of new products with raw materials recovered from recovered components/products.	9,67
EFFICIENT PRODUCTION	**7,61**

S1 User orientation / product customization	7,67
User customization.	7,67
S2. Extend lifespan	**8,33**
Free extended warranty or low-cost maintenance.	8,00
Products can be upgraded to extend their useful life.	8,00
Company offers maintenance and / or repair services for the product.	9,00
S3. Pay per use (Servitization of the product)	
Possibility to use the product without buying it (have its property)	1,00
S4. Data management and processing (Industry 4.0)	**2,89**
Virtual communication channels with the user.	5,00
Use of IoT, sensors, smart labels, etc., at the product.	1,83
Management of product sharing platform.	1,83
SERVITIZATION	**4,97**

TB1.Selective collection	
To encourages the user and facilitate the collection of their used products obtaining income with them.	**1,33**
TB2. Reuse (Second Hand)	
Active participation at the second hand market.	**5,67**
TB3. Waste valuation: recycling + energy	
Active waste management (recycling or energy valorisation operations) of its own waste or discarded products.	**6,50**
TAKE-BACK	**4,50**

CSR1. Primary corporate CSR, within the company	**9,33**
Working conditions of staff (safety, health and training).	**9,17**
Equity, code of ethical conduct, conciliation measures and additional social benefits.	**9,50**
CSR2. Secondary CSR, area of influence	
Actions of a social nature throughout its value chain or local region.	**4,33**
CSR3. Tertiary CSR, with the world	
Alignment and promotion of social values and financially support to projects with social and / or environmental aim (worldwide).	**5,50**
SOCIAL RESPONSABILITY	**6,39**

COMPANIES DESCRIPTION:

Please, briefly describe the general characteristics of the enterprises interviewed (size, business, context...).

STRENGHTS COMMENTARY:

Slovenian results regarding design aimed at valorization at the end of life are over average. This implies easy disassembly and the use of recyclable materials. Why, in your opinion, Slovenian companies do stand out in this design strategy?

Slovenian companies showed very good self-grades in respect to the active collaboration with suppliers and customers to implement transparency and agility in the flow of information. Please, briefly comment this result, trying to find an explanation to it based on your experience (technical, cultural, contextual, etc.).

Slovenian results regarding working with near suppliers or distribution logistics optimization are really high. Could you explain if there is any special consideration regarding this?

All Slovenian companies self-diagnosed showed to offer products that can be upgraded to extend their useful life and maintenance/or repairing services. Is this a common practice in Slovenian furniture industry? Could you detail some examples of upgrading, or what the companies consider as upgrading?

WEAKNESSES COMMENTARY:

Slovenian average result regarding eco-design, LCA methodology and certification according to ISO 14006 standard is quite poor. Would you be able to explain why eco-design and environmental assessments are not relevant for Slovenian furniture companies?

Regarding environmental benefits communication, Slovenian results have been poor (with big differences between companies). Could you explain which could be the differences or insights between the companies with higher results and those with lower results?

None of the Slovenian companies offers free extended warranty services or included-in-price or low-cost maintenance. Please, briefly comment this result, trying to find an explanation to it based on your experience (technical, cultural, contextual, etc.).

Only one of the Slovenian companies assessed showed to use IoT, smart labels, etc. and to manage platforms for product sharing. Which is the profile of this company? Could you explain which kind of IoT, smart labels, etc. have been implemented by that company?

Slovenian results in respect to selective collection are very bad. Do you believe there is any specific barrier (lack of incentives to the companies, for example) that might have influenced on this result?

Spanish average results

E1. Ecodesign management and environmental communication	**5,57**
Design and product assessment (LCA) from environmental and produtct life-cycle perspective. ISO 14006 certification.	3,71
Environmental requirements to providers	6,43
Environmental infortmation to customers.	6,57
E2. Design aimed at reducing the use / consumption of resources	**7,00**
Use of recycled orrenewable materials.	6,71
Design products to minimize the use of resources	7,29
E3. Product functional optimization	**7,05**
Products are efficient in use.	6,29
Market studies to identify the real needs of the users.	7,71
Information to the user to improve product performanceor use experience.	7,14
E4. Extend use life	**7,14**
Design durable products with easy maintenance	6,71
Modularity and repairability (replacement parts)	7,57
E5. Design aimed at valorisation at the end of life	**6,79**
Design for dissassembly	6,57
Use recyclable materials.	7,00
ECODESIGN	**6,71**

EP1. Environmental management systems	**5,71**
Fulfilment of environmental legislation.	6,00
From production environmental improvement to environmental management system (certified ISO14001 or EMAS).	5,43
EP2. Lean Manufacturing + Industry 4.0	**6,43**
Technologies to improve production efficiency (Lean Manufacturing + Industry 4.0).	6,71
Active collaboration/ flow of information at the value chain.	6,14
EP3. Industrial symbiosis	
Application of industrial symbiosis	**5,57**
EP4. Efficient technologies	
Efficient technologies (use of raw materials and energy consumption) + energy from renewable sources.	**4,00**
EP5. Efficient logistics (supply and distribution)	
Near suppliers and distribution logistics optimization.	**7,29**
EP6. Remanufacturing	
Infrastructure and incomes from the repair, reprocessing and manufacture of new products with raw materials recovered from recovered components/products.	**4,71**
EFFICIENT PRODUCTION	**5,62**

S1 User orientation / product customization	
User customization.	7,86
S2. Extend lifespan	**5,52**
Free extended warranty or low-cost maintenance.	5,57
Products can be upgraded to extend their useful life.	6,57
Company offers maintenance and / or repair services for the product.	4,43
S3. Pay per use (Servitization of the product)	
Possibility to use the product without buying it (have its property)	**2,29**
S4. Data management and processing (Industry 4.0)	**3,81**
Virtual communication channels with the user.	6,43
Use of IoT, sensors, smart labels, etc., at the product.	3,14
Management of product sharing platform.	1,86
SERVITIZATION	**4,87**

TB1.Selective collection	
To encourages the user and facilitate the collection of their used products obtaining income with them.	**2,57**
TB2. Reuse (Second Hand)	
Active participation at the second hand market.	**3,00**
TB3. Waste valuation: recycling + energy	
Active waste management (recycling or energy valorisation operations) of its own waste or discarded products.	**4,29**
TAKE-BACK	**3,29**

CSR1. Primary corporate CSR, within the company	**7,71**
Working conditions of staff (safety, health and training).	7,29
Equity, code of ethical conduct, conciliation measures and additional social benefits.	**8,14**
CSR2. Secondary CSR, area of influence	
Actions of a social nature throughout its value chain or local region.	**6,29**
CSR3. Tertiary CSR, with the world	
Alignment and promotion of social values and financially support to projects with social and / or environmental aim (worldwide).	**4,86**
SOCIAL RESPONSABILITY	**6,29**

COMPANIES DESCRIPTION:

Please, briefly describe the general characteristics of the enterprises interviewed (size, business, context...).

STRENGHTS COMMENTARY:

Despite the bad result regarding 'Take-back' dimension, waste valorization assessment had a higher result than the others. Which can be the factors/reasons that might have influenced the companies on this behalf?

WEAKNESSES COMMENTARY:

Regarding eco-design, LCA methodology and certification according to ISO 14006 standard, Spanish results were poor. How can be the lack of ISO 14006 certification explained? Are there any barriers to the Spanish furniture companies that might have been affecting them on this regard?

Spanish results regarding 'Efficient technologies' turned out to be quite poor, while there are big differences between companies. Please, briefly comment this result. Which could be the main factor affecting the companies performance on this behalf?

Spanish companies self-assessed poorly regarding 'remanufacturing'. However, there is a big difference between the companies assessed, since two of them evaluated themselves with the highest score (10, 9) and the other five companies self-evaluated with the lowest (1). Which can be the main difference between these companies on this behalf?

The results achieved by Spanish companies in respect to maintenance and repairability of the products were poor, but with high differences between the companies assess. Which can be the main difference between these companies on this behalf?