Co-funded by the European Union

Infuri

WHITE PAPER




RECOMMENDATIONS, OPPORTUNITIES & OPEN CHALLENGES

Table Of Contents

Introduction

Written by **CRETHIDEV**

1.1 Circular Economy In The European Furniture Industry

In order to drive sustainable development within the planet's boundaries and to respond to today's significant environmental and sustainability challenges, our production and consumption systems need a new configuration. One strategy consists of transitioning to a circular economy (CE) - **a regenerative and radically more efficient economic system** where:

- The value of resources is maximized
- The overall use of resources is minimized
- Waste and toxic materials are designed out
- The system is powered by renewable energy .

Environmental and economic benefits of a circular system require technical and organizational innovation that have to concur at the micro- (organization), meso- (business ecosystem) and macro-level (socio-technical system).

Table 1. Snapshot of the furniture industry in EU.

Number of companies	> 130,000 companies (mostly small or medium sized enterprises) (European Commission, 2021)
Number of Employees	ca 1 million people (European Commission, 2021)
Turnover	> EUR 96 billion (in 2020) which equates to approximately one fourth of the global furniture industry (European Commission, 2021)
Major producers (countries)	Germany, Italy, Poland and the United Kingdom are among the 12 largest furniture producers globally with more than 60% of Europe's production share and 15% of world production (CSIL, 2020)
Comments	Eastern Europe production is growing fast. Also, the European furniture industry is facing numerous challenges with China in terms of competition, innovation, ageing of the workforce, and higher operational costs in the EU due to higher standards in sustainability, including technical and environmental aspects (European Commission, 2020). Almost two-thirds of high-end furniture products sold globally are produced in the EU (European Commission, 2021).

The EU furniture industry has been showing a growing level of awareness of the urgency to pursue sustainable development via a more efficient use of resources and the adoption of sustainable business models.

Thanks to world-renowned expertise in the design and manufacture of high-quality products with a value chain indicating potential to be adapted to a circular business ecosystem, furniture businesses could yield several environmental, social and economic benefits **while leading by example for a system shift**.

In essence, the transition to circular flows entails the design of new products and services, new business models and business relationships between suppliers and customers, but also the development of behaviors, regulations and information dynamics.

Companies may contribute to a transition to a CE through the adoption of circular business models (CBMs) that take on slowing, closing, or narrowing resource loops (Geissdorfer et al., 2017).

Also, in order for a fundamental system change to a circular setting to occur even beyond a global economic crisis such as the current one due to the outbreak of Covid19, there is a need for continuous development of **pre conditional measures** at a system level.

These may be actions that require coordination between stakeholder groups, such as systems for information, quality assurance, measurement, and follow up of sustainability indicators, as well as issues related to regulations, labor market, education, and procurement with revised requirements and international development. For all the forces in this system to work together, it is therefore essential to draw plausible scenarios, clearer pictures of what a circular future might look like, how the roles of the various actors may change and how each stakeholder can influence and enable such a transition

Moreover, unlike linear business models, circular business models focus on maximizing value from resources, reusing or minimizing waste. In principle, this means that the environmental impact of circular business models is likely to be less as these require fewer resources such as materials and energy for new production, emit less pollutants from production as fewer items are produced, and reduce

The above probably explains why CE strategies for furniture emphasize eco-design and design for disassembly which are actually the most commonly used initiatives

The EU's chemicals strategy for sustainability towards a toxic-free environment, both describes the importance of CE and the prerequisite of toxic free materials for circularity, including the safe by design concept. Design for disassembly will be an important part as chemicals legislation will develop, which might affect content requirements, for example functional additives for polyurethane foam or artificial leather. The Action Plan related to the strategy is extensive and includes numerous activities. Overall, it is worthwhile noting that the EU considers a transition to a CE as the solution for achieving sustainability rather than an option as evidenced by its ambitious scheme to a CE that is corroborated by a series of reports such as the "Monitoring framework for the CE" (COM(2018)29)

The report examines ten indicators of different areas including production, raw materials and waste management while depicting the CE as the greater opportunity to meet climate goals, preserve resources, maximize their value and generate job opportunities and social equality.

Several studies reveal that recycling is the most commonly used circular strategy in businesses especially in construction, metals and fabrication, textiles, wood and paper, rubber and plastics, waste management, electrical equipment, machinery and transportation equipment, along with the manufacturing industry at large.

The majority of CE initiatives have been implemented at a macro level, i.e., in cities or regions or nation-wide. The penetration of CE has had mixed results in various industries ranging from a high and rapid uptake of CE principles (waste management, electrical and electronic equipment and construction industries) to a slow approach towards CE industries (e.g., mining and quarrying, health equipment and entertainment and recreation)

A synthesis of the European Union's CE strategies in business in relation to the sectors of industry in which they have been adopted is depicted in Figure 3. Each green cell represents a specific strategy implemented by a sector. In the furniture sector (see the column circled in red in the below figure) the main CE strategies include customisation, ecodesign, ecolabelling, element recovery, functional recycling, reduction, reuse, take-back and trade in. One may infer that there is a growing attention on the use of materials, on extending the product lifespan and on extracting more value from the products by keeping circulating longer. By reusing, renovating, upgrading and remanufacturing products and components to continuously meet the customers' furniture demand, both the need for natural resources and climate impact are expected to diminish while new business models emerge and maintain the industry competitiveness.

1.2 The difficulties of changing from Linear Economy to Circular Economy

Written by **VIRTUAL CAMPUS**

1.2.1 Linear Economy

The linear economy is a system where resources are extracted to make products that eventually end up as waste and are thrown away. Products and materials are generally not used to their full potential in a linear economy and, as the name suggests, always move in one direction – from raw material to waste. It is a polluting system that degrades natural systems and is the driver of global challenges, including climate change and biodiversity loss.

The negative effects of this approach, in the form of environmental damage and the loss of valuable materials, are clear. They are driven by the mismanagement of resources and land in industries across the economy, including agriculture, construction, and transport.The way our economy functions is destroying the natural capital on which it depends. This is seen in the soils that are being degraded, the ocean that is being polluted, the biodiversity that is being lost, the freshwater that is drying up, and the forests that are being felled.

The traditional linear economy pattern follows the take-make-dispose scheme. This method of production is maximizing the uses of collected raw materials before it transforms them into products, eventually disposing of unusable material. Linear economy value is created by mass production and the selling of products. Due to this scheme, which is similar to a flat line, the linear economy can be found under the name 'open cycle.' The main problem that arises with this production approach is the irrational usage of the available resources. During the process of production, resources are generally not implemented in the final product. Expectedly, this creates a double negative effect, because it negatively affects both the environment and climate changes.

Linear economy exhausts raw materials and energy, which results in CO2 emissions. Statistically, around 68% of input raw materials are of non-renewable nature which poses a grave problem and threat to the environment, given that these products are either detonated or burned. Besides the severe damage to the biosphere, the downfall of the linear economy is human exploitation as well. This system puts an emphasis on the products themselves, and the outcome of such an equation is – mass production and consumption. Yet, to supplement the markets' needs, the economy exploits workers

1.2.2 Circular Economy

Circular economy comes as an alternative to the method of the linear economy. The name was first coined by Pierce and Turner in 1989, although the theory originates from the 1960s. Many environment-conscious theorists and economists have predicted the aftermath of mass consumption and production. In the meantime, they had been elaborating on a better and more conscious way of production.

Compared to the linear economy, the circular economy works in a far smoother and more sustainable way. The main focus of this economy is to maintain the added value of material while eliminating waste as best as possible. The circular economy is concentrated on the usage of products as resources. The method used by the circular economy is actually the 3R principle: reduce, reuse, and recycle.

Particularly, exhausting resources are minimally used during production, while the old, used products are reused to the maximum. What makes this production method circular is that the raw materials are recycled or reused. To put it simply, to create one product, we use minimal resources. Then, that same product will be additionally reused instead of disposed of. This provides a healthier approach towards the environment as well as more sustainable usage of the pool of resources.

Due to this circulation of used products as a basic resource, the method applied in a diagram appears as a circle, hence the name. A circular economy can be also found under the name of 'closed system of production.

1.2.3 The difficulties of changing from Linear Economy to Circular Economy

As of 2022, only 8.6% of the world economy is considered circular. Expanding and mainstreaming the transition to a global circular system thus requires unprecedented collaboration between sectors and countries across the world. It is possible to divide the main challenges of transitioning to a circular economy into four main categories: redesigning value chains, aligning circularity with business interests, promoting a "circular behavior", and designing effective policies.

While it is widely acknowledged that collaboration is key in the transition to a circular economy, there are challenges to collaboration when it comes to the competitive position of individual companies. The first barrier is the costs of the transition (e.g. R&D, asset investments, digital infrastructure) and the questions around who should foot the bill. Second, competition with (often cheaper) virgin materials makes the business case for recovery managers relatively uneconomic and hence less desirable. Delivering a new product instead of an existing one that breaks down is usually cheaper simply because the design of current products mainly emphasizes function; it does not take repair into account.

In addition, people play an important role in the transition towards a circular economy, but the question concerning the division of labor in the promotion of circular behavior is still very much debated. Producers point to policymakers to create incentives for businesses (for example, to create a level playing field) and customers point to producers (for example, to create waste-free products). Efforts are required by all sides in order to alter the current reality, in which products are designed to fail (after a certain time), to become outdated and out of fashion. An example of a policy effort to implement legislation encouraging a circular economy is the EU's proposed eco-design resolution to ensure a longer shelf life for products.

Alongside climate change, environmental degradation poses one of the most critical threats to humanity in the 21st century. The transition to a circular economy across the globe is thus a crucial step in confronting this challenge. Similar to the fight against climate change, the transition to a circular economy on a global scale needs to take place in a holistic and systemic fashion that rests on multi-sector and international coordination and collaboration efforts.

1.3 About the INFURI Project

The EU furniture industry is a labor-intensive sector dominated by SMEs, which nowadays is facing different challenges such as increasing competition from countries with lower production costs, increasing raw materials and labor costs, an aging workforce and difficulties in attracting younger workers. Reconversion of the industry applying circularity has the potential to tackle these challenges, through repairing, refurbishment and remanufacture, allowing value recovery, economic growth and job creation within the European furniture industry, while saving on resources and the environment. As for the EC report on the implementation of the Circular Economy Action Plan (2019), the transition from linear to circular requires significant changes at micro, meso and macro levels, from innovation at business model and value chain level to the introduction of new technologies.

Being the furniture industry dominated by SMEs most of the employees do not have a tertiary education level and are not acquainted with circular economy aspects. To address skills gaps and mismatches and to strengthen human capital along the entire furniture value chain, it is fundamental to invest in skills, design, creativity, research, innovation and new technologies.

Based on these assumptions, INFURI project main objectives were:

- to equip furniture employees with relevant skills related to circularity;
- to spread innovative and sustainable circular business models in the furniture industry contributing to enhance its competitiveness;
- to develop an innovative training approach and learning tools adaptable to other industries;
- to increase SMEs ability to analyze their business under a “circular” point of view;
- to promote synergies and cooperation among businesses, universities, research centers and other relevant stakeholders operating in the furniture sector following a circular
- approach;
- to spread circular procurement principles with benefits in terms of corporate social responsibility.

The project is implemented by a complementary partnership composed of 9 institutions from 7 European countries (The Netherlands, Poland, Greece, Italy, Portugal, Slovenia and Spain). The initiative has been directly addressed to 18 European furniture SMEs employees, as well as to 36 furniture companies and relevant stakeholders active in the sector of furniture & circular economy of countries involved in the project.

Moreover, within INFURI project 5 intellectual outputs are produced

- IO1 - Living Labs and "Circularity matters: gaps, limits and constraints in the EU
- furniture industry" paper
- IO2 - MOOC "Managing a furniture company in the era of circular economy"
- IO3 - Book of lectures "Integrated competencies and systemic approach in the era of circular economy"; IO4 - Multi-actor circular network
- IO5 - Circular Procurement Guidelines for Office Furniture.

All intellectual outputs are uploaded on the website and made available to target groups, partners, associate partners and external stakeholders during and beyond the life of the project.

Within IO4, the creation of this document “INFURI WHITE PAGES” was foreseen which aims to provide providing recommendations about circular approaches, new business opportunities related to circular systems and challenges, based on the main aspects that EU SMEs of the furniture branch face today, and were also taken into account in present project. In more specific the topics that are included in present documents are :

A. ECODESIGN
B. EFFICIENT PRODUCTION
C. SERVITIZATION
D. TAKE BACK
E. CORPORATE SOCIAL RESPONSIBILITY
F. EU LEGISLATIVE DEVELOPMENTS IN CIRCULAR ECONOMY

2. Applying Circular Economy In The EU Furniture Industry

2.1 Eco Design

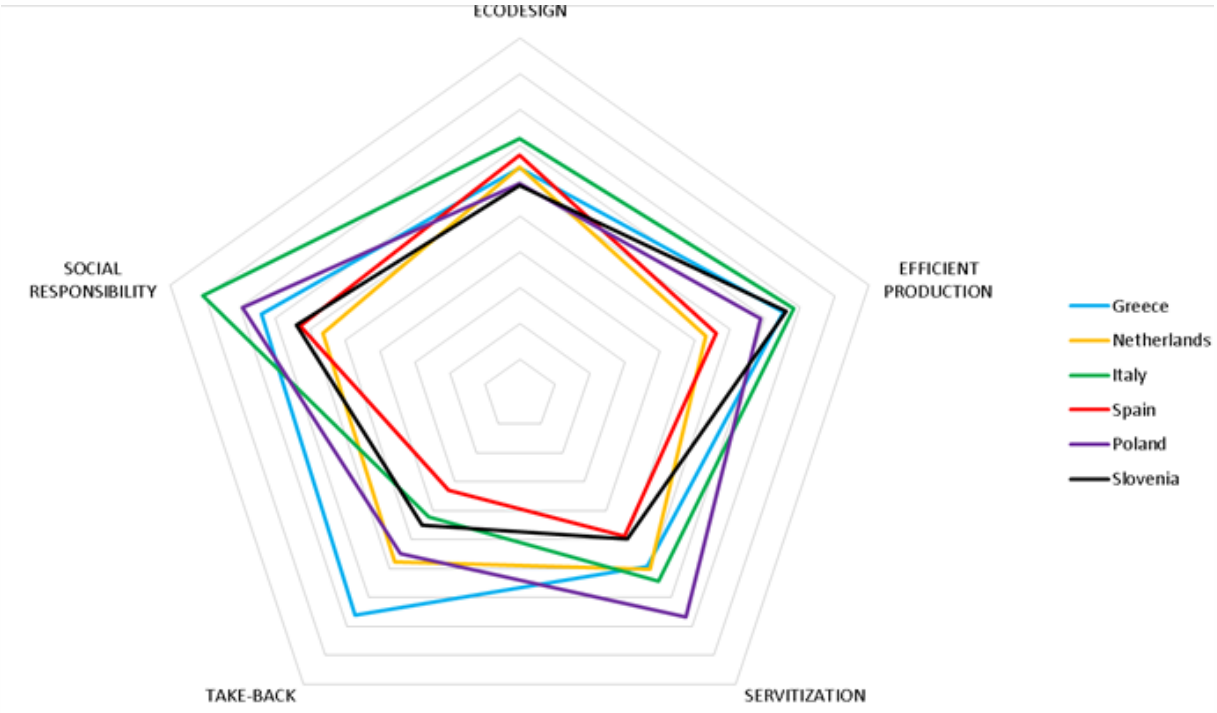
Written by **AIDIMME**

Status

The INFURI Project involved conducting a series of self-perception surveys on circularity in companies located in the countries that make up the project consortium. These surveys were carried out in a total of 31 enterprises located in Greece, Italy, the Netherlands, Poland, Slovenia and Spain. All of them belonged to the furniture sector.

The results were positive as, although in some cases the alignment with circular economy principles was not optimal, they allowed for the detection of patterns and in-depth analysis of the reasons for circular performance in each country. Circularity was disaggregated, as can be seen in the graph below (showing the averages for each participating country), into different categories in which to classify circular economy strategies.

As can be seen, no country particularly stood out from the rest, as the weaknesses of one are strengths for others, and vice versa. However, the overall assessment of countries such as Greece and Italy stand out.



In relation to eco-design (the field covered by this white paper), it is worth noting that the implementation and use of ISO 14006 is not at all widespread in Europe. In Greece, for example, none of the companies reported using it. However, the example of Italian companies stands out, which, in contrast to the European average observed, do apply the

standard with some frequency (even more than Spain, the only country where the standard is certifiable).

With reference to the results, in general terms, it was concluded that the differences between the countries studied are appreciable, with economic and socio-cultural factors being fundamental. On the other hand, it was concluded that a more detailed statistical and comparative study is needed.

Up To Date

On 30 March 2022, a proposal was published by the European Commission for Ecodesign for Sustainable Products Regulation. The aim is to make products on the EU market increasingly sustainable, by enabling far-reaching performance and information requirements – known as 'ecodesign requirements' – to be set on a wide range of them to improve their circularity, energy performance and other environmental sustainability aspects. Article 5 mentions that there shall be developed to each specific product group ecodesign requirements to improve the following aspects:

(a) durability; (b) reliability; (c) reusability; (d) upgradability; (e) reparability; (f) possibility of maintenance and refurbishment; (g) presence of substances of concern; (h) energy use or energy efficiency; (i) resource use or resource efficiency; (j) recycled content; (k) possibility of remanufacturing and recycling; (l) possibility of recovery of materials; (m) environmental impacts, including carbon and environmental footprint; (n) expected generation of waste materials.

New Perspectives

There is a proposal of product groups to be included under this regulation (end products and intermediary products), and a preliminary study made by the Join Research Centre (JRC) on new product priorities, which is based on the level of environmental impact and on its improvement potential. According to this report, the top scoring product groups resulted to be, by far, Textiles and footwear, being the next highest-scoring product groups Furniture, Ceramic Products and Tyres.

Furniture exhibited a high improvement potential in terms of waste generation and lifetime extension, which could be improved by performance requirements on design for durability, design design for refurbishing and/or recyclability, etc.

According to a JRC study, further European regulations on eco-design requirements specifically to furniture products are to be expected. Even though there are ongoing national regulations on circular economy in several countries, like France or Spain, all the national initiatives should be harmonized under the European framework to avoid new market barriers and support companies. This will require an effort from companies to adapt their design process and their business models and will suppose the opening of new business opportunities. Those companies implementing eco-design earlier, will have a competitive advantage when the regulation enters into force.

The diversity of materials and furniture designs is wide, but its products offer a huge potential to apply all eco-design strategies and can also improve non environmental aspects (such as economic balance by efficient material use or market access and public image).

Finally, the information to the consumer is a key factor. To ensure the confidence on this information, regulated and standardized validations and/or scoring systems have demonstrated their success. CEN standardization group working in this area for furniture products (CEN/TC 207/WG 10 - REQUIREMENTS AND TOOLS FOR FURNITURE CIRCULARITY) should be a strong support to any eco-design European regulation to be developed. On the other hand, it is recommended the certification according to the standard ISO 14006 on eco-design management system, and its inclusion as a requirement in Green Public Procurement, (based on Spanish experience for furniture, where it is at the same level as ISO 14001 and 9001). Those management systems have demonstrated their efficiency among the industrial sector to improve environmental performance and quality within the industry.

2.2 Efficient Production

Written by **OIGPM**

Status

Taking into account Efficient production in furniture plants, each company has an impact on the natural environment, expenditure on the type of production, responsibility for non-existent necessity and obligation. The ecological aspect is a very important element of the responsible business policy. It is he who ultimately determines the quality of our lives in the long run. The area of the natural environment covers a very wide spectrum of issues, such as decisions regarding the selection of raw materials, packaging or distribution, waste management, environmental education, etc.

The environmental awareness of the company should primarily consist in promoting pro-ecological attitudes among stakeholders, including employees, suppliers and recipients, and not only in the implementation of specific norms and standards. Compared to other materials, such as plastics, the production of wooden products requires very little energy. Its natural decomposition or disposal is also much safer and environmentally friendly compared to other materials.

Even despite the use of finishing products in the production of furniture, such as impregnations and varnishes, disposal is much less burdensome for the environment and is much faster than that of plastic, glass or metal products. It is gratifying that the awareness of pollution resulting from the production and disposal of plastics is becoming more and more common, and the awareness of designers, furniture manufacturers and end users of the use of ecological agents for furniture surface finishing is growing, which are becoming more and more popular every year.

New Perspectives

Installation of filters and dedusting installations, maintaining an appropriate noise level, waste management - all investments related to ecology are expensive, but if implemented correctly and at the right time, they will increase the company's efficiency and competitiveness. Many plants still have older, low-capacity dedusting machines in operation, often operating at 50-60% of their original capacity. They generate high energy consumption necessary to power them. Appropriate dust extraction machines are also one of the foundations of workplace safety. New generation extraction machines help improve ambient air quality by reducing residual dust below 0.1 mg/m^3, which is comparable to the level of air

pollution in an office room with a large photocopier. Many companies completely forget about such an important issue as the safety of people working in production. Interestingly, this is quite significant also in the case of plants that work on very expensive and complicated systems and production lines. It happens that even in applications for co-financing from the European Union, companies forgot to include a point that would also allow them to obtain funds for an additional element of the production line dealing with the transport and disposal of waste. This leads to situations in which very modern plants are unable to directly transport or dispose of waste and have to incur additional costs for their storage and commissioning the utilization to external plants. Eco-innovations also apply to this area.

However, clean air is not the only way to reduce the negative impact on the natural and working environment. You also need to remember about "noise pollution". co-innovative solutions that reduce the noise level in furniture, wood and carpentry plants are currently in great demand. Reducing the noise level is necessary in the case of plants located in the vicinity of other companies and residential buildings, as well as when the plant is located near a forest or bird habitats.

2.3 Servitization

Written by **CIAPE/MATERIALLY**

As defined in the INFURI partnership “Servitization refers to industries using their products to sell outcomes as a service rather than a one-off sale”.

Published Results

At the beginning of the INFURI project, Living Labs with 30 furniture companies were organized. The objective of these Living Labs was the one of self-assessing their level of circularity and understanding their learning needs on the different aspects connected to -circular economy.

“Servitization” was one of the dimensions included in the Self-diagnosis tool provided to furniture companies.

Companies involved in the Living Labs were quite interested in being trained on “servitization”; this is the reason why a specific lesson was included into “Unit 6 – Customer Services” of the MOOC “Engaging furniture consumers in the era of circular economy- Managing a furniture company in the era of circular economy”

Current Status

Servitization in furniture follows an economic trend in the light of ongoing globalization, which is less focus on production and more focus on service oriented initiatives. This shift to a services mode not only helps in raising opportunities for employment at multiple levels but has also been termed as an environmentally friendly mode of doing business by increasing the lifespan and scope of finished products.

Based on the Living Labs results, we can state that there are some differences among the countries regarding the level of implementation of servitization. Cultural and legal context can explain these results.

Generally speaking, nowadays, 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.

New trends, developments & perspectives

Servitization is increasingly becoming an important aspect of improving the socio-economic development of any country. Opportunities for servitization for furniture companies exist in reverse logistics; maintenance; refurbishing; recycling.

New signals, drivers and trends

Trend: Bio-future

Signals: Biocomposite material produced from plant fibers and binders of natural origin. It uses renewable raw material of European origin used without treatment (wood chips, cane, straw, flowers, various plant wastes) to create products and semi-finished products where the raw material is still recognizable, while also maintaining tactile and olfactory characteristics. Thanks to the biobased binder, the material is biodegradable.

https://www.organoids.com/

Signal: Made exclusively from 100%* recycled and FSC®-certified paper, it is a panel made from 100% naturally occurring materials: FSC®-certified recycled cardboard or paper that is treated with patented Petro Free™ resins.

https://www.paperstone.eu/

Signal: Skin of arapaima, one of the world's largest freshwater fish, and one with significantly less impact than cattle. Also called pirarucu, it is native to the Brazilian coast, a region where it is a primary source of food and is a protected species managed by local people, who have contributed to the regeneration of the species. The skins are 100 percent by-products of the food industry. Applications include bags and tabletops.

https://www.novakaeru.com.br/

Trend: There was waste

Signals: Decorative veneer for creating interior surfaces consisting of Mexican corn bratee (corn cob wrappers), naturally colored. The corn cob wrappers are flattened and glued by hand onto plywood substrates, or other rigid panels, and cut to size by laser cutting. The material is produced in collaboration with local farmers as part of a project to promote local employment development. Applications include interior design, accessories, furniture and furnishings.

www.fernandolaposse.com/

Signals: Resign® is a recycled veneer made from textile remnants in bio-based fibers. The veneer is made from textile scraps, such as old jeans, military clothing, suits, and white denim. The fibers are first shredded into small pieces and then carded into felt. The felt is finally pressed with a biodegradable binder made from potatoes or cornstarch into a hard veneer.

https://www.planqproducts.com/rezign-recycled-veneer

Signals: It would amount to 850,000 tons of butts abandoned in the environment each year, which take about 2 years to degrade, among other things releasing toxic substances into the environment.

Several start-ups have therefore launched projects to collect, process, purify and transform cigarette butts into polymers or yarn for upholstery. https://www.re-cig.it/

2.4 Take Back

Written by **STEP/ORNIK**

A “Take Back Program” or a "Take Back Approach" is usually an initiative organized by a manufacturer in order to collect used products and reintroduce them to the original processing and manufacturing cycle. A company may implement this program in collaboration with end-of-life logistics and material processing firms.

Take back is one of the principles of circular economy that helps 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.

Published Results

At the beginning of the INFURI project, Living Labs with 30 furniture companies were organized. The objective of these Living Labs was the one of self-assessing their level of circularity and understanding their learning needs on the different aspects connected to circular economy.

“Take Back” was one of the dimensions included in the Self-diagnosis tool provided to furniture companies. Regarding the "Take Back" strategies there have been found high legal barriers in some countries as well as business models that do not consider (or are not prepared to) this kind of operation, or its economic benefits are not clear in the current market.

In the Book of Lectures, one of the project results of the INFURI project there are presented case studies from different countries. The organizations included in a book of lectures are examples of good practices and can be a helpful source for other SMEs that want to change their business model from linear to circular, using the "Take Back Approach".

Implementation of Take Back Approach

The treatment at the end of life of products can be optimized 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.

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.).

The end-of-life of waste can be improved with proper management information to the user, 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.

The waste hierarchy establishes the following prioritization in relation to the treatment of waste : Except for prevention, all other operations must be carried out by an authorized 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 ensure their energy valorisation which is the primary use of the waste as a fuel or other means of producing energy.

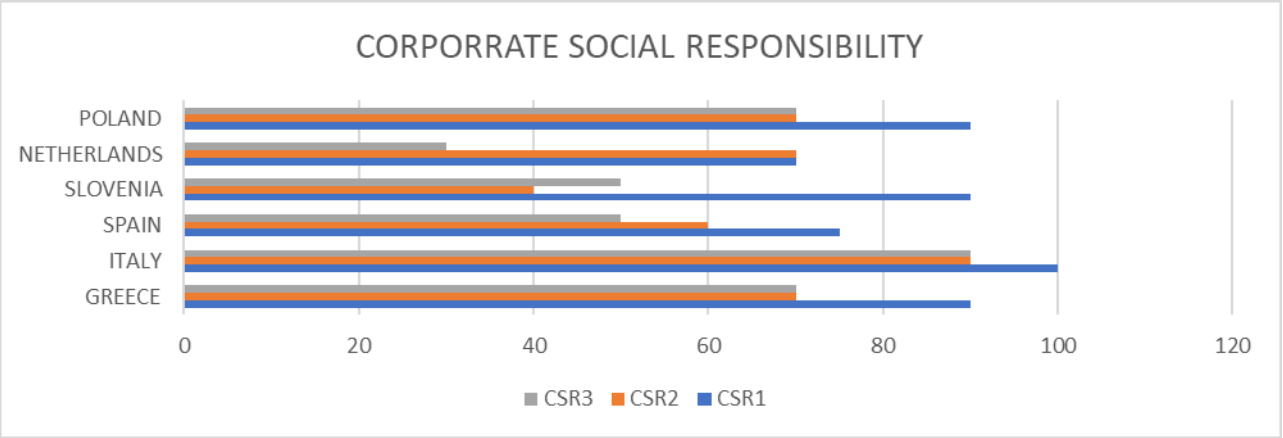
2.5 Corporate Social Responsibility

Written by **CRETHIDEV**

Within INFURI project s implementation, and in more specific, within Circular Economy Living Labs furniture companies, had the chance to self-diagnose themselves regarding their alignment with circular economy principles. The results of this work concerning CSR, were set as question to the and more specifically the three subtopics of CSR

- CSR1 : Primary corporate SR, within the company
- CSR2 : Secondary corporate SR, area of influence
- CSR3: . Tertiary Corporate SR, with the world

Are shown in following Chart



In all countries, CSR3 is lacking in all participated representative SMEs, followed by CSR2

Within INFURI implementation specific recommendations were made and communicated during the LIVING LABS and multiplier events and concern mainly ways and means for improving the respective SMEs performance:

- Safety and health of the products/services offered.
- Aid groups of users with special needs
- Selection of suppliers and collaborators based on their CSR and environmental practices.
- Support "The 10 Principles of the Global Compact" and with it the Sustainable Development Goals (SDG

CSR corporate social responsibility is considered as a duty in front of the society,inclusion of the parties involved, improvement of the quality of life,economic development, ethical business practices, compliance with the law, voluntarism, human rights,environment protection, transparency and responsibility. Social responsibility, responsibility for the environment and economic responsibility are the fundamentals of CSR. As consumers worldwide demand sustainable products across a variety of fields, every industry must adapt to satisfy their requests. Furniture customers are no different, and sustainable furniture – whether for home, office, or entertainment venue – has become a highly sought-after product. From the wood used for frames to the fabric and chemicals used to finish pieces of furniture, there is a lot that goes into sustainable sourcing and production, and consumers are doing the research to ensure that the furniture they buy is environmentally friendly

There is a growing number of furniture companies partnering for adopting circular strategies, as:

- Product redesign to achieve sustainability targets set including the use of alternative materials.
- New circular models such as Product-as-a-Service.
- Product take back schemes.
- Recovering of waste

Still, many of these initiatives are in piloting stages or in development. The expectation for the future is increasing collaboration and innovative solutions put in the marketplace and well established circular business models. Nowadays, the companies who integrate sustainability into the core of their strategy are better positioned to create value and foster company longevity. As the expectations on corporate responsibility increase, and as transparency becomes more prevalent, sustainability is becoming a primary focus for supply chains across all industries including the furniture sector.

In the future there will be a growing demand from millennial and Gen Z consumers, who choose brands whose values align with their own and that buying sustainable furniture is likely to drive the market in the future. Also, there will be more transparent and regulated green marketing that requires simple, clear and easy-to-use product information, whereas, it is expected an increase of products capable of demonstrating in a transparent and easily verifiable way, their sustainability, accredited by scientific validations or certifications, by independent third parties who have knowledge, expertise and tools.

It's worth mentioning that, BlackRock, the largest asset manager in the world insists that sustainable investment options have the potential to offer clients better outcomes, they are making sustainability integral to the way BlackRock manages risk, constructs portfolios, designs products, and engages with companies So, the largest asset manager in the world loudly saying that they think that climate change is a key risk.V In the following link are presenting 15 best cases of eco and sustainable furniture companies for 2023:

https://www.thegoodtrade.com/features/eco-friendly-furniture-brands-for-a-stylish-and-conscious-home/

2.6 EU Legislative Developments In Circular Economy

Written by **WUAS**

The EU furniture industry predominantly consists of SMEs and employs approximately 1 million European workers and manufactures approximately a quarter of the world's furniture, representing a EUR 84 billion market equating to an EU28 consumption of ~10.5 million tons of furniture per annum.

Published Results

In the IO1 scientific paper produced as part of the project implementation which used Q-methodology and involved the participation of 30 furniture companies from five EU countries, the variety of barriers to the transition to circularity, as perceived by the Circular Economy Living Labs European furniture companies, was examined and the findings discussed. Seven barriers or challenges to circular economy in the furniture industry were identified in the paper, one of which was Policy and Regulatory barriers and challenges, resulting from the policies or behavior of public institutions, including regulatory barriers. Under this category, specific statements pertaining to legal and regulation issues with circularity were referred to in the Q-set, namely the statements that laws and industry regulations hinder circularity.

In the IO3 Book of Lectures produced by the project consortium, several furniture companies from the partner countries were examined as case studies. Some of these case studies similarly revealed that legal and regulatory matters arose as challenges for these companies, particularly in the areas of take back, servitization, packaging, recycling and waste management.

Current Status

The EU recognises the labor-intensive and dynamic aspect of the furniture industry and its ability to adapt to technology and innovation. However, there are a plethora of areas of EU and national law which directly and indirectly affect the EU furniture industry. Each sector within the furniture industry has its own set of laws and regulations applicable to it. Some of these areas include:

- Products (import and export)
- Waste Management
- Recycling
- Take-back
- Servitization
- Packaging and labeling
- Health and safety (products and workplace)
- New trends/developments/perspectives

The EU Commission adopted three new initiatives that are necessary for making the European Green Deal a reality. The Commission is proposing new rules to restrict EU-driven deforestation and to create new rules to facilitate intra-EU waste shipments with the aim of promoting a circular economy and tackling the export of illegal waste and associated waste challenges to third countries. To fight the ongoing climate change and biodiversity loss, this new law obliges companies to ensure that a series of products sold in the EU do not come from deforested land anywhere in the world. More information is available here:??

Solutions to regulatory compliance and overcoming the legal barriers

There are a number of ways that furniture companies can help ensure legal and regulatory compliance with relevant EU and national laws:

- Information dissemination of regulations through infographics, flyers, etc.
- Awareness raising/promotion
- Furniture industry associations compilation of applicable local or EU laws
- Furniture industry associations to partner with local or European lawyers to provide a free “legal hub” or advice clinic for furniture industry legal/regulatory queries

Some relevant EU legislation and information sources:

- **Council Regulation (EC) No 2173/2005 of 20 December 2005 on the establishment of a FLEGT licensing scheme for imports of timber into the European Community:** http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:347:0001:01:EN:HTML
- **Directive 79/117/EEC of 21 December 1978 prohibiting the placing on the market and use of plant protection products containing certain active substances:** http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31979L0117:EN:HTML

- **Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labeling of dangerous substances:** http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31967L0548:EN:HTML
- **Directive 1999/45/EC of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labeling of dangerous preparations:** http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31999L0045:EN:HTML
- **Directive 76/769/EEC of 27 July 1976 on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations:** http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31976L0769:EN:HTML
- **REACH regulation. REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/ EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC:** http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:136:0003:01_REG_2006_1907_280:EN:HTML
- **Directive 1999/13/EC of 11 March 1999 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations:** http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31999L0013:EN:HTML
- **Directive 2004/42/CE of the European Parliament and of the Council of 21 April 2004 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products and amending Directive 1999/13/EC:** http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:143:0087:0096:EN:PDF
- **Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control:** http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31996L0061:EN:HTML
- **Directive 2002/45/EC of 25 June 2002 amending for the twentieth time Council Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations (short-chain chlorinated paraffins):** http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:177:0021:01:EN:HTML
- **Directive 1999/44/EC of 25 May 1999 on certain aspects of the sale of consumer goods and associated guarantees:** http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31999L0044:EN:HTML
- **Directive 94/62/EC of 20 December 1994 on packaging and packaging waste:** http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31994L0062:EN:HTML
- **European Ecolabel for textiles, mattresses and furniture [draft]:** http://ec.europa.eu/environment/ecolabel/
- **Milieukeur (The Netherlands) for textiles and furniture:** http://www.milieukeur.nl/nl-NL/default.aspx

INFURI Infographics

7 European countries in project consortium	9 Institutions forming the project consortium	36 Companies active in furniture & circular economy
18 Furniture SMEs employees to receive training	3 At least 3 circular product ideas created	196 Participants to the multiplier events
10000 Stakeholders reached through dissemination activities	250 Subscribers to the MOOC at the end of the project	1 Book of lectures "Integrated competencies and systemic approach in the era of circular economy"
1 Manifesto	150 members subscribing to the Multi-actor circular network at the end of the project	1 Circular Procurement Guidelines for Office Furniture

Project Partners

virtualcampus

WITTENBORG University of Applied Sciences

MATERIALLY

ciape

AIDIMME TECHNOLOGY INSTITUTE

cre thi dev

OGÓLNOPOLSKA IZBA GOSPODARCZA PRODUCENTÓW MEBLI

MIZARSTVO ORNIK

STEP Institute

Infuri

INFURI: Useful Links

Project Website

- infuri.org

Social:

Facebook: INFURI PROJECT

LinkedIn: MULTI ACTOR CIRCULAR NETWORK

QR Code: