WOOD SECTOR, ENVIRONMENTAL SUSTAINABILITY AND SOCIAL DIALOGUE

PROJECT FUNDED BY THE EUROPEAN UNION

good wood

Foreword

The Good Wood project, which Confapi and all partners have carried out with commitment and passion, by involving also European, national and local stakeholders, had the aim of enhancing and strengthening the social dialogue as a tool to facilitate the transition towards green and circular economy objectives, of companies in the wood and furniture sector. The current historical moment requires extraordinary and urgent measures from the European Union, that should consider the full involvement of all the actors, including employers and trade unions organizations.

We are all aware that the renovation in a green key represents an opportunity that companies can and must catch; it can be a lever for growth also in terms of new production models and jobs.

Along with EU objectives, the project aimed at training and informing the actors involved, with particular attention to new technologies to encourage innovation in both production processes and products, also through the requalification of the employees in the wood-furniture sector.

The work carried out has highlighted how the role of national governments and the EU is essential; as a matter of fact, institutional support is necessary to the change process providing incentives and protection measures, within a vision that is not limited to single and isolated actions but it is able to revise the industrial policy. It is strategic to encourage not only the bipartite social dialogue, but also the tripartite dialogue, thus involving all the social partners and the competent public authorities.

At the end of this positive and profitable path, which I hope can become as a pioneer for future pondered and tailored actions, I sincerely thank all the "fellow travellers": Centro Studi delle Camere di Commericio Guglielmo Tagliacarne, the Bulgarian Chamber of Commerce, the Bulgarian trade union PodKrepa, the European Confederation of Woodworking Industries (CEI-BOIS) and AIMMP, the Association of the Wood and Furniture industries of Portugal. A sincere acknowledgement also to the sectoral trade unions FILLEA CGIL, FILCA CISL and FENEAL UIL for their precious and active collaboration in all the project activities.

Maurizio Casasco
President of CONFAPI

_ **This report was fulfilled within the Project "Good Wood – Notes for a green social dialogue" financed by the grant agreement: VS/2019/0029. "Good Wood" was implemented by a transnational and multi-stakeholder partnership:**

- **Confapi (Coordinator)** – Italian Confederation of Small and Medium Private companies
- **CEI-Bois** – The European Confederation of Woodworking Industries
- **CSGT** – Centro Studi delle Camere di commercio Guglielmo Tagliacarne srl– research centre of the Italian Union of the Chambers of commerce
- **BCCI** – Bulgarian Chamber of commerce – the main employers' association in Bulgaria
- **Podkrepa CL** – workers' association at national level in Bulgaria
- **AIMMP** – Woodworking and furniture industries association in Portugal.

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_ **Project "Good Wood – Notes for a green social dialogue" co–financed by the EaSI Programme (PROGRESS) of the European Union, 2018.**

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Presentation

This report has been fulfilled by the "Good Wood Project", funded by the European Commission within the EaSI Programme.

The "Good Wood Project" was aimed at fostering social dialogue for the sustainable development of the wood sector, by carrying out workshops, seminars, study visits involving social partners. In parallel, the project's partners carried out a desk and field research. The research was intertwined with the other activities: research's results were presented within the project's events, while these latter provided information, contacts or follow-up for the study.

The research, carried out by all partners (at Eu level, in Bulgaria, Italy and Portugal) was specifically aimed at:

1. Summarising the legal and policy framework for the wood sector about the project's topics: environmental sustainability, bioeconomy, circular economy, social dialogue
2. Collecting the point of view of a stakeholders' panel about the main challenges for a green wood sector
3. Finding experiences of green social dialogue.

The report is structured in three parts:

Part 1 – Structure of the sector, legal and policy framework, key-actors

Part 2 – The opinion of stakeholders

Part 3 – Experiences of green social dialogue.

Before to start the research, the project's partners shared a glossary, that was useful to have a joint approach to key-words like: social dialogue, bioeconomy, circular economy, circular bioeconomy; the glossary is in Appendix to this report.

The report is available in the various languages of the project: Bulgarian, English, Italian and Portuguese.

The original texts for analysis at EU level, at national level for Bulgaria and Portugal have been written in English. The original text of the analysis at Italian level was written in Italian.

Executive Summary

THE WOOD SECTOR AT EU LEVEL

The EU Timber and Woodworking industries are a complex and labour-intensive sector. **They rank as the EU's fourth largest manufacturing industry by number of enterprises (170.000), followed by furniture (120.000). The woodworking industries alone employ over 1 million people and contribute €133 billion to EU GDP (2017).** Add the furniture sector, and the workforce rises to nearly 2 million and annual turnover to €243 billion. Both industries comprise a large number of SMEs, many of which in rural areas.

The overall performance of the sector is heavily affected by the general economic landscape and, in particular, by access to raw materials – on the supply side – and the performance of the construction sector – on the demand side.

THE WOOD SECTOR IN BULGARIA

Forestry has long traditions in the country and plays an important economic, environmental and social role. The country is the third richest in biodiversity in Europe and forests have increasingly important environmental and recreational role.

Forests account for 31,6% of the national territory which ranks Bulgaria 19th in Europe. Most of the wooded territories are state owned (73% of their total area).

Production of raw timber and timber-based products is directly related to the furniture manufacturing. **Furniture industry produces about 2.6% of the total GDP of the country, a little less than 10% of the industrial GDP and over 20% of the GDP in the processing industry.**

According to statistical data, over 97% of the firms in the furniture sector in Bulgaria are SMEs. The manufactured products, depending on the object of activity, include hotel furniture, office furniture, kitchen furniture, framed furniture, upholstered furniture, tables and chairs, tubular furniture.

THE WOOD SECTOR IN ITALY

In Italy, the active enterprises of the "wood supply chain" (which includes the wood industry – ATECO 16.29.1 and the furniture manufacturing industry – ATECO 31.01) are 51,933 (as at 31/12/2018) and make up 1.01% of the total of active enterprises.

The added value of the entire wood supply chain (more than 11 billion euros in 2016) accounts for 0.77% of the national one and has grown by 0.01 percentage points despite the reduction in the number of companies.

In terms of added value and employment, it is the furniture industry – strictly speaking – that performs better. Investments in tangible assets have increased despite the contraction of the entire entrepreneurial system in the wood sector. In 2016 they represented 1.48% of total investments. **In the furniture sector, exports represented 2.12% of total exports in 2018, equal to 11 billion euro**, compared to 0.41% represented by exports of processing companies.

THE WOOD SECTOR IN PORTUGAL

The wood sector represents 8% of the overall manufacturing industry in Portugal.

51% of the active companies are situated in the north region and 26% in the central region of the mainland. 87% of the companies employ less than 10 workers which is a standout characteristic of the sector's size distribution (see Table 1).

The wood processing sector employs around 60 000 workers, exports approximately 3 000 million euros per year and shows a positive trade balance of nearly 1 000 million euros.

The sector represents north of 0.7% of the Portuguese Gross Added Value (GAV) and around 2.6% of the GDP.

Both 1st transformation of wood and furniture industry presented a positive GAV evolution of 2,5% per year, between 2010 and 2018.

GREEN POLICIES AT EU LEVEL

The "EU Forest Strategy" revised in 2013 covers the whole value chain and provides a key reference for EU forest-related policy development; it emphasizes the role of sustainable forest management and the multifunctional role of forests.

In December 2019 the European Commission unveiled the proposal of an **EU Green Deal** as the new 'growth strategy' of the EU: it mentions forests with a strong emphasis on preservation and restoration but, actually, it does not elaborate on the opportunities that forests and the forest-based sector can offer. Under the same 'Green Deal Package', the European Commission also published an updated **Circular Economy Action Plan** on the 11th of March 2020, with relevant elements for the woodworking sector: it announces a "sustainable product policy legislative initiative" (2021) to widen the Eco-design Directive and to apply circular principles to priority product groups including furniture; it announces a "Strategy for a Sustainable Built Environment" (2021).

The EU in late 2018 issued the update of its original 2012 **Bioeconomy Strategy**. The aim was 'to accelerate deployment of a sustainable European bioeconomy to maximize its contribution towards the 2030 Agenda and its Sustainable Development Goals (SDGs) and the Paris [Climate Change] Agreement'. The wood value chain is at the heart of this transition.

The European Environment Agency clearly stated that circularity and resource efficiency play a key role in the development of the forest-based bioeconomy (see Report No 8/2018 "The circular economy and the bioeconomy. Partners in sustainability"). Priority actions include: increase the mobilization of wood from sustainably managed forests; increase the resource efficient use of biomass while adding value by developing new products based on wood-processing residues; enhance the durability of wood-based

products; increase the use of wood in construction; improve product design to facilitate disassembly; introduce renew and repair schemes for durable products, such as furniture.

Strengthening industrial policies and "greening" the economy are listed among the priorities identified by EU social partners. Main initiatives at EU level in this area included the monitoring and follow-up on policies concerning wood mobilization, renewable energy policy and circular economy. A recent initiative addressed specific industrial relations-related concerns through a joint employers-workers approach: it is the joint CEI-Bois/EFBWW/European Panel Federation (EPF) project: the first part of the project resulted in an **agreement signed by EFBWW and EPF on an "Action Guide" on formaldehyde**, which aims to implement exposure limits in the wood-based panels manufacturing industry.

GREEN POLICIES IN BULGARIA

The main legislation is the **"Forest Act" (2019)**, with more than 20 implementing regulations.

Other strategic national documents which outline the framework for the development of the sector:

1. The **"National Strategy for the Development of the Forest Sector 2021-2025"**
2. The **"Strategic Plan for the Development of Forest Sector 2014-2023"** which defines 20 Operational Goals: for the implementation of the Goals 102 Actions are planned and a total amount of appr. 200 000 000 EUR is allocated.

Both social dialogue and circular bio-economy are considered as crucial for a sustainable development in the wood sector. Unfortunately, under the pressure of economic factors, the policy pursued in Bulgaria at national level, for decades, to preserve, develop and expand the forest has been abandoned.

Industrial relations still do not adequately relate to sustainable development issues. The challenge now is to link sustainable development to key matters like: competitiveness of the Bulgarian wood processing industry, forestry management systems, standard of living for forest workers employed in the processing industry, natural heritage conservation matters.

At the same time, in Bulgaria **the importance of environment and the impact of the work of enterprises on it is gaining momentum.** More and more employers anticipate and attach importance to the environmental sustainability but clauses about this in collective agreements are still missing.

GREEN POLICIES IN ITALY

In October 2019, the **Climate Decree**, which represents a pillar of the Green New Deal – together with the Budget Law, the Environment Annex to the Save-Sea Law – provides for the approval of a National Strategic Plan.

With the **decree of 11 January 2017** and modification of July 2019 the adoption of **Minimum Environmental Criteria** (CAM) is dictated for the supply and rental service of interior furnishings. This obligation ensures that the national green public procurement policy is incisive not only in the objective of reducing environmental impacts, but also in promoting more sustainable, "circular" production and consumption models and in spreading "green" employment.

With the receipt and **adoption of the package of European Directives on waste and circular economy**, Italy should anticipate to 2025 the European target of 60% recycling of urban and related waste now set at 2030, through a waste sorting exceeding 70%, and bring the reuse and preparation for reuse of usable urban waste to 10%.

In October 2017, in line with the commitments made in September 2015 for the United Nations Agenda 2030 for Sustainable Development, the Environment Ministry (MATTM) drew up the **"National Strategy for Sustainable Development"** with the primary objective of improving socio-economic well-being conditions in Italy. This National Strategy mentions circular and resilient economy to climate change as the key- reference model.

On the bio-economy front, in 2016 the Presidency of the Council of Ministers promoted the **"Italian Bio-economy Strategy"**, involving several ministries, the Agency for Territorial Cohesion and the national technological clusters of green chemistry (SPRING) and the agro-food sector clusters (CLAN). The "Italian Bioeconomy Strategy" (BIT) aims to achieve a 20% increase in economic activity and jobs in the Italian bioeconomy by 2030.

In the **GreenItaly Report 2019**, by Fondazione Symbola and Unioncamere, Italy is indicated as the European leader in the circular economy and waste recycling. An indicator of the rate of "circularity of the economy" is provided by the rate of use of secondary materials compared to raw materials: with 17.1% of the total consumption of secondary materials (which also includes biomass and energy materials) Italy has a performance far above the European average.

As far as post-consumer wood waste is concerned, **more than 95% of wood waste is sent to plants for the production of panels for the furniture industry**.

In Italy, Bilateral bodies are often the expression and result of social dialogue. They are private bodies made up of trade unions and employers' associations. Social dialogue includes: joint observers, continuous training and the establishment of Bilateral Bodies for training as provided for in the CCNL; guidelines for supplementary bargaining; second level agreements of some large companies.

GREEN POLICIES IN PORTUGAL

The National Strategy for Adaptation to Climate Change (ENAAC 2020) was adopted by the Portuguese Government on April 2010 (Government Order no. 24/2010, April 1st); it is structured around four objectives:

- reducing vulnerability and increasing the response capacity
- participation, awareness raising and dissemination
- international cooperation.

In Portugal the **Strategic Framework for Climate Policy** (QEPiC) was approved by the Government Order no. 56/2015. The QEPiC aims are to:

- promote the transition for a low-carbon based economy through the Commitment to a Green Economy (CCV)
- ensure sustained reduction on the emissions of greenhouse gases (GHG), in order to comply with the energetic efficiency (in 2030 minus 30% in reference to the energetic baseline)
- ensure a committed participation on international negotiations and cooperation
- promote research, innovation and the increase of knowledge
- promote social involvement on climate change challenges, enhancing the rise of individual and political actions
- improve the efficacy of the information systems, of the reports and of monitoring
- ensure governance and the incorporation of climate aims on sector domains as foreseen, namely, by the National Plan for Climate Change (PNAC 2020/2030) and the National Strategy for Adaptation to Climate Change (ENAAC 2020).

The goal of strengthening a circular bio economy in the wood sector in Portugal can be made possible by the combination of increasing social dialogue and new styles of management, in order to achieve a better prepared economic growth for all stakeholders.

THE OPINION OF STAKEHOLDERS AT EU LEVEL

The structure of the wood industry also differs across Europe. Although differences among countries and sub-sectors exist, **a consolidation trend is also observed, with a restructuring of the industry towards fewer but bigger companies**. Integration is also a well-established trend in Nordic countries, where the biggest wood-based biorefineries are based wood products manufacturers co-exist along integrated production plants using biomass to produce wood products, pulp and paper, bio-based chemicals, biofuels, electricity and heat. Despite the general market concentration trend, **market niches for small enterprises will still exist and small businesses will retain profitability**.

On the regulatory side, the EU ambition to be trailblazer in the global fight against climate change by committing to climate neutrality by the mid-century may entail a loss of competitiveness due to increased regulatory burden, unless measures to correct possible imbalances and to **ensure that the transition is carried out in a socially fair way** are put in place. At the same time, the transition to the circular bioeconomy provides opportunities for the sector and European companies and workers in general.

The wood sector, in general, will have (the chance to) grow positive reputation in the society. The latest spring of youth activism in climate change issues may also result in a stronger orientation towards sectors that provide bio products and that contribute strongly to a circular economy.

Skills opportunities can result in individual growth and better career opportunities for workers. The changes in technology, products and production processes might also offer opportunities for new forms of work organisation and better working conditions.

The shifts towards fully circular value chains will also offer employment creation opportunities. One example is the current trend of increased reuse and refurbishment of furniture products. Initiatives to set up Extended Producer Responsibility schemes are also gaining ground in Europe and will provide job opportunities at all levels for collection, as well as other supporting roles such as reverse logistics.

THE OPINION OF STAKEHOLDERS IN BULGARIA

Concerning, deficits, obstacles, barriers, bottlenecks and challenges, the stakeholders mentioned: low labour productivity; difficult access to financing and to EU structural funds for investment in renovation of equipment in logging, machines, production lines and transport of wood; lack of support on behalf of the banks in the investment projects; low share of certified forest territories and certified forest companies; weaknesses of the policies and of the strategic framework for the sector; deficit of sustainably-sourced, quality and price competitive raw materials, especially hardwood; energy efficiency, energy costs of the final production are twice higher compared to the EU average energy costs; the wages are the lowest in the EU which is a competitive advantage but it also makes the industry unattractive for skilled workers; production costs are higher compared to the average for the EU; low I Technology investment, innovations, R&D etc.

The main suggestions for the improvement of the situation in the wood sector in Bulgaria are:

- the sector needs a restructuring and consistent reforms to face the accelerated globalization and the higher competition
- efforts should be made to reach sustainable market positions
- there is a need of consistent labour strategy in the sector, aiming at more and higher quality jobs
- there is need of a vocational training strategy aiming at higher standards of qualification on sustainability and circular bio-economy
- it is important to foster a pro-active attitude on behalf of the workers and their trade unions
- the collective bargaining in the sector must be developed in the context of a "green social dialogue".

Proposals to support circular bio-economy in the wood-processing sector:

- the implementation of circular economy business models requires a structural change within organisations, with top-management commitment
- the personal commitment and the attitude of the workers is also crucial for introducing a green and circular approach: companies in which circularity is tied to social goals, ethics and spirituality can enhance staff engagement
- to increase awareness on the point that a green and circular approach means to enhance competitiveness
- circular business models need new production approaches:
  - adoption of product life-cycle approaches
  - transparency and reporting of non-financial information
  - relevance of achieving sustainability objectives (CSR strategies and UN 2030 Agenda)
  - stakeholders' and consumers' awareness
  - full understanding by all stakeholders of the concepts of value, circularity and their opportunities, being aware of the potential to create new jobs

THE OPINION OF STAKEHOLDERS IN ITALY

The stakeholders who participated agreed on the following recommendations:

- to strengthen social dialogue to win a challenge that concerns a shared responsibility between employers and workers
- to foster the cross-sector perspective, "setting rules for the supply chain", promoting unification/harmonization of contracts
- to support "extended environmental responsibility", it is essential to include "sustainability clauses"in contracts, from the national level up to the company level, acting along the entire chain of processing and use of materials
- integrative (second level) bargaining is a fundamental catalyst to "hinge" "green" product/process innovations
- European-level agreements can play a crucial driving role, but they must be accompanied by extensive information, awareness-raising and training measures at national and local level
- the social partners, united, can promote decisive project partnerships, encouraging experimentation, practices and voluntary codes that can bring along the necessary cultural change
- social partners are called upon to build consensus on the values of environmental sustainability, acting together to improve the effectiveness of communication and awareness raising among all stakeholders
- social dialogue is a key driver for action on legislation and policies at EU level
- legislative and governing bodies at national level must be urged by the social partners both to promptly and effectively transpose European

directives and to adopt incentives rewarding good companies and workers
- social dialogue must be strengthened in a tripartite form – by fostering dialogue with institutions at all levels, also by setting up steering committees to promote projects and experiments
- social dialogue must activate joint pathways for entrepreneurs and workers: information, training, exchange of experiences, co-definition of models and processes
- social dialogue can act effectively to promote actions in the educational and cultural field, through lifelong campaigns and initiatives, starting from primary school.

THE OPINION OF STAKEHOLDERS IN PORTUGAL

The excess of legislation in Portugal (both European directives, and national laws) can be overwhelming in some cases, concerning responsibility and liability for waste management. **Small companies are concerned** about not complying with all waste management legislation due to lack of clear information, preparation and qualification of their workers as well as management.

There are several examples of companies already implementing eco-friendly products using the main concepts of a circular bio-economy in order to maximize their products life cycle. They value, not only the economical aspect, but also the social responsibility, considering they must encourage their workers by giving meaningful examples concerning environmental protection.

A concept based on the life-cycle analysis approach is being implemented by some companies, taking form as *"product custody"* or companies being *"custodians of their products"*. These voluntary initiatives or market demands can promote a more responsible mind-set for companies and workers and with a clear conscience that they are contributing to a greener and circular economy.

The collective work agreement was published in 2012 and it is outdated at this point. There is a need to harmonize professional categories in the wood working sector, throughout Europe, in order to benefit labour dynamics within the communitarian market and clearly define skills and careers progression. **Social dialogue needs to be reinforced and strengthened in order to turn the current challenges into opportunities, both for workers and companies.**

Stakeholders recognized that the major strength of social dialogue is the prevention of social conflicts and also the possibility to adapt working conditions. Also, it was referred the need to make all the necessary adjustments to improve the coverage of collective agreements to the numbers that existed just before the crisis period.

There is a strong **need to conciliate the global economy with the defense of social rights**. Therefore, social dialogue is often made at an informal level in some companies, in order to involve the workers towards a more awareness of the green economy, and the implications it can have on each company.

Moreover, it was a generalised consensus that **there´s a need to improve workers qualifications**, through the combination of formal education, and specific training courses, also **to prepare for the new challenges towards new business models**, and the incorporation of the concept of a circular bio economy that has to be regarded in an integrated way.

Another important aspect was **the need to reinforce / reinstate collective agreements** contracts in order to have a more competitive sector.

EXPERIENCES OF GREEN SOCIAL DIALOGUE

The main finding was the need for this kind of experiences both at EU and National level. Four experiences were selected, because they combine a green approach with the social dialogue component.

THE EUROPEAN AGREEMENT ON PREVENTION OF FORMALDEHYDE EXPOSURE represents an example of a European level agreement that outlines a strategy of social dialogue and, at the same time, provides elements of operation and comparison that can be used by individual companies, with an active role of workers.

THE EXPERIENCE OF A LEVEL II BARGAINING AGREEMENT ADDRESSING THE ISSUE OF CO_2 EMISSIONS, although concerning a production sector other than wood, is a case of second-level bargaining that includes sustainability objectives – a type of tool that the social partners recognize to be crucial to concretely implement sustainable and participatory business models.

THE ACTION-TRAINING PATH “TOWARDS A SUSTAINABLE BUSINESS WITH THE SDGS AS A COMPASS!” offers a model of continuous training on corporate sustainability objectives, conceived thanks to social dialogue. The programme pursues the implementation of participatory measures by workers, management and stakeholders.

CNUF® - ECOLOGIC CERTIFIED COFFIN, is a certification scheme that works in several dimensions to promote cooperation between social partners aimed at beneficial work conditions at all levels whilst cooperating for an enhanced environmentally responsible production.

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STRUCTURE OF THE SECTOR, LEGAL AND POLICY FRAMEWORK, KEY-ACTORS

Part 1 of the report includes: a summary of the socio-economic and legal framework of the wood sector, and references to the main policies and actors with specific reference to sustainability issues.

Due to the project's focus, attention was paid to environmental sustainability on the one hand and social dialogue on the other.

This part has been thought as a basic information document for the stakeholders of the project: employers' associations and unions; it is both to contextualize the other activities of the project, and as a starting point for next insights and reflections.

The analysis was conducted on a documentary basis by the project partners, at EU level, Bulgaria, Italy and Portugal.

1.1. The framework at Eu level

1.1.1. THE WOOD SECTOR AT EU LEVEL

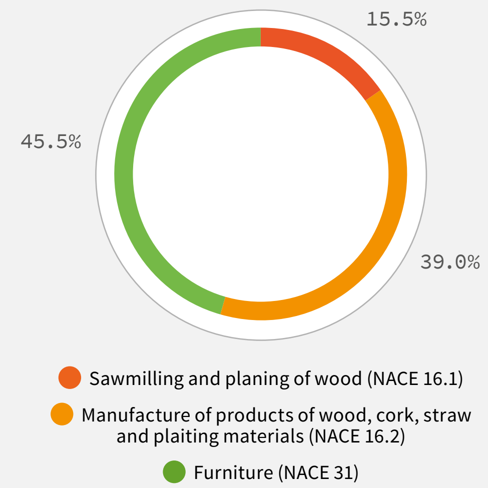
Structure of the sector, main features and economic data

The EU Timber and Woodworking industries are a complex and labour-intensive sector. They rank as the EU's fourth largest manufacturing industry by number of enterprises (170.000), followed by furniture (120.000). **The woodworking industries alone employ over 1 million people and contribute €133 billion to EU GDP (2017). Add the furniture sector, and the workforce rises to nearly 2 million and annual turnover to €243 billion.** Both industries comprise a large number of SMEs, many of which in rural areas.

Timber and woodworking companies are also highly varied, focusing on a wide range of different products, and stages of timber processing along the supply chain. They include sawmills, planing plants, preservative treatment specialists, flooring manufacturers, plywood and other wood-based panel producers, and makers of veneer, joinery, carpentry, construction products, pallets, packaging and more.

In 2016 the production value of the woodworking and furniture industries amounted to 221 million euro. The relative importance of sub-sector is showed in Figure 1 below:

Figure 1:
Production value 2016 – relative importance of subsectors
Source: Eurostat



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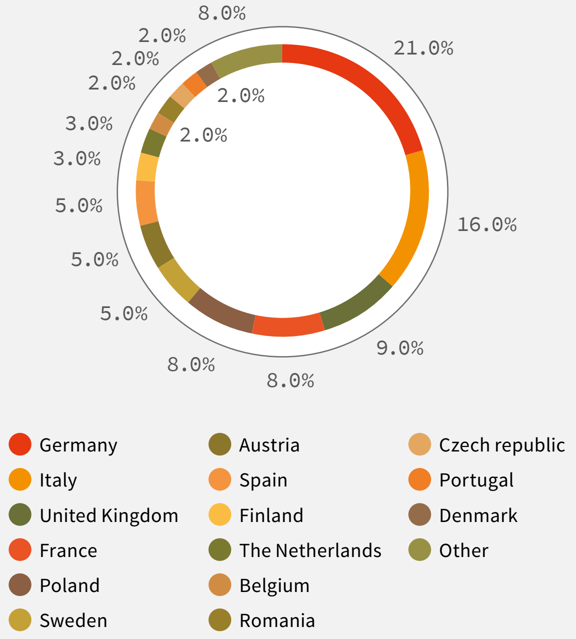
Germany, Italy, UK, France and Poland have the largest timber and furniture industries, but the sector is a significant engine of the economy across the EU.

Figure 2:
Production value 2016 – Relative importance of EU Member States (NACE 16+31)
Source: Eurostat



Around 35% of the production of the woodworking industries is exported, with a strong prevalence of intra-EU trade, which accounts for 70% of the total export, whereas the furniture sector sold 22% of its production outside the EU. Overall, the value of EU-28 exports of woodworking and furniture products amounted to almost 33 billion EUR in 2016, while imports from non-EU countries accounted to 34 billion euros. Furniture accounted for almost 73% of the extra-EU imports of woodworking products in 2016. The overall performance of the sector is heavily affected by the general economic landscape and, in particular, by access to raw materials – on the supply side – and the performance of the construction sector – on the demand side.

Main contents of policy, regulatory and legislative framework

The Woodworking industry actively contributes to the attainment of the EU key political priorities, such as the reduction of GHG emissions in line with the Paris Agreement and the deployment of an EU circular bioeconomy, while ensuring jobs creation and employment stability.

At the same time, it is faced with a complex policy landscape at EU, national and international level: a recent study[1] commissioned by the European Commission indicated that as many as 245 policy items affect the forest-based sector at EU level, directly or indirectly. A brief summary of the most relevant policies is provided below.

Agricultural and forest-related policy:
The "EU Forest Strategy" revised in 2013 covers the whole value chain and provides a key reference for EU forest-related policy development. The Strategy, that is voluntary by nature, emphasizes the role of sustainable forest management and the multifunctional role of forests, the contribution of the forest sector to rural development, growth and job creation, and global forest responsibility.

Climate change and energy policies:
This area provides a significant direct impact on the sector. The 2030 Energy and Climate Framework sets targets to improve the EU's energy efficiency by at least 32.5% and to increase renewable energy to at least 32% of the EU's final energy consumption by 2030, and to cut at least 40% greenhouse gas from 1990 levels.

1. Rivera León, L., Bougas, K., Aggestam, F., Pülzl, H., Zoboli, E., Ravet, J., Griniece, E., Vermeer, J., Maroulis, N., Ettwein, F., Van Brusselenm J. & Green, T. 2016. An assessment of the cumulative cost impact of specified EU legislation and policies on the EU forest-based industries. Brussels: DG GROW.

Meeting the renewable energy targets for 2020 and 2030 will directly impact the way harvested wood is utilized, as the competition between different uses of wood (energy and material) will increase, along with pressure on forest resources. The EU LULUCF Regulation incorporates GHG emissions and removals related to agricultural land and forestry into the EU's climate framework from 2021 to 2030.

Environmental policies:
EU is at the frontline of work on combating deforestation and forest degradation: the EU's FLEGT (Forest Law Enforcement and Governance) Action Plan was established in 2003. It aims to prevent the importation of illegal timber into the EU, improve the supply of legal timber and increase demand for timber from responsibly managed forests. The EU Timber Regulation (Reg. EU 995/2010) prohibits placing for the first time illegally harvested timber and timber products on the EU market.

Employment policies:
While the competence in this field is mostly responsibility of EU Member States, European policies set minimum standards which have an impact of the EU Woodworking and Furniture sector.

Product policies:
EU product policy is mainly aimed at ensuring the health and safety of the consumer. The Construction Products Regulation sets out the conditions for marketing construction products and the related use of CE marking (Regulation EU 305/2011).

Most recently, the European Commission unveiled the proposal of an **EU Green Deal** as the new 'growth strategy' of the EU [2]. The package includes a range of policies and legislative proposals that overall aim at climate-neutrality, decoupling of growth from resource use, and nature conservation, all in a just and inclusive way. The Green Deal Communication mostly mentions forests with a strong emphasis on preservation and restoration but does not elaborate on the opportunities that forests and the forest-based sector can offer. These are summarised in the concept of **circular bioeconomy**. Some of the most important features can be mentioned here:

- the full climate mitigation potential of the forest sector is best achieved by taking into account both the action of forests and harvested wood products as a carbon sink and carbon stock, and the substitution effect of wood products; **timber buildings are key allies in decarbonising construction**: 1 m^3 of wood stores almost 0.9 ton of CO_2 and allows to save on average another 1 ton of CO_2 compared to functionally equivalent materials;
- **forest bioeconomy and circularity are closely linked;** wood is a renewable resource; it is processed efficiently, as by-products and residues can be used for raw materials of other wood-based products or energy; it is reusable and recyclable: for example, in the wood packaging sector recovery, repair and reuse of wooden pallets are already standard industrial practices;
- **bioeconomy brings jobs and growth in rural, peri-urban and urban areas**: 170.000 companies in the EU belong to the woodworking industry, which gives jobs to 1 million workers and adds 142 billion euros to the economy. The forest-based sector as a whole represents around 420.000 enterprises for a total turnover of over 520 billion euros and around 3,5 million workers.

Under the same 'Green Deal Package', the European Commission also published an updated **Circular Economy Action Plan** on the 11th of March 2020 [3]. The Communication also contains relevant elements for

2. COMMUNICATION COM (2019) 640 final - The European Green Deal
3. Communication COM (2020)98 final, " A new Circular Economy Action Plan For a cleaner and more competitive Europe"

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the woodworking sector; to name a few:

- it announces a Sustainable product policy legislative initiative (2021) to widen the Ecodesign Directive beyond energy-related products, and to apply it to priority product groups including furniture – a sector closely linked to the woodworking one.
- it announces a Strategy for a Sustainable Built Environment (2021), which would include revised rules under the Construction products Regulation;
- it recognises the role of long-lived wood products as nature-based solutions to store carbon removed from the atmosphere through photosynthesis.

Among the main institutional research centres for the sector it is important to mention the **European Forest Institute and European Joint Research Center**, and in particular the Knowledge Centre for Bioeconomy launched in 2017.

1.1.2. SOCIAL DIALOGUE

The EU social dialogue on woodworking covers activities defined by NACE (Rev. 2) code 16, and namely sawmilling and the manufacture of wood, cork, straw & plaiting products. Sectorial social partners are the **European Federation of Building and Woodworkers** (EFBWW – workers' organization) and the **European Confederation of woodworking industries** (CEI-Bois – employers' organization.)

The areas of work for the current committee include industry policy, including innovative actions, demographic changes & sustainable development, vocational education & training, health & safety and environmental policy.

Strengthening industrial policies and a **"greening" the economy are listed among the priorities identified by social partners for the years 2018-2019**[4]. Main initiatives at EU level in this area included the monitoring and follow-up on policies concerning wood mobilization, Renewable Energy policy and Circular Economy.

In addition, two recent initiatives addressed specific industrial relations-related concerns through a joint employers-workers approach. The joint CEI-Bois/EFBWW/European Panel Federation (EPF) project, awarded by the European Commission, focused on the Perspectives and Challenges of the Woodworking Industries in Europe[5] and delivered practical recommendations to companies and workers of the sector. The first part of the project resulted in an **agreement signed by EFBWW and EPF on an "Action Guide" on formaldehyde**[6], which aims to implement exposure limits recommended by the European Scientific Committee on Occupational Exposure Limits in the wood-based panels manufacturing industry and thus to accelerate European-wide protection of workers. The second part of the project focused on how to increase the attractiveness of the sector towards workers.

The second initiative also addressed safety at the workplace: the **"European Wood Dust Conference"**, organized in collaboration with the EU social partners served as a forum for exchange of information and good practice on the implementation of the new limit value for exposure to hardwood dust recently set by the EC in the European Directive 2017/2398.

1.1.3. SUSTAINABLE AND CIRCULAR BIOECONOMY

The Paris Climate Agreement and the Sustainable Development Goals set the global agenda on today's sustainability challenges. On the one hand, as con-

4. Work Programme for the Sectoral European Social Dialogue of the Woodworking Industries 2018-2019
5. Grant Agreement VS/2017/0021
6. A follow up of this agreement is proposed in part 3 of this report

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firmed by the recent IPPC special report[7], an increase beyond 1.5° C compared to pre-industrial levels would entail devastating changes to the ecosystems and life on the planet. On the other hand, the trend of growing global human population, with aspirations to a lifestyle equal to that of the richest nations today, makes it a challenge to reverse the adverse impacts on the planet of our current economic development model.

The deployment of a circular bioeconomy is increasingly seen as part of the answer to these challenges, and the woodworking industry has a role to play in this transition.

As a reply to these economic, environmental and societal challenges, the **EU in late 2018 issued the update of its original 2012 Bioeconomy Strategy**. The aim was 'to accelerate deployment of a sustainable European bioeconomy to maximize its contribution towards the 2030 Agenda and its Sustainable Development Goals (SDGs) and the Paris [Climate Change] Agreement', in line with the objectives previously set by the Circular Economy Action Plan (2015).

The holistic approach to circular bioeconomy means to reduce of the dependence on fossil fuels for energy and manufacturing and limit the use of other finite resources, while using more renewable, biological-based resources. Those require less energy and result in fewer emissions in production, use and disposal than functionally equivalent counterparts, and are capable of being recovered, recycled and re-used.

The wood value chain is at the heart of this transition: it begins with sustainably sourced raw materials, followed by highly resource-efficient processing providing a multitude of wood products for numerous applications. Additionally, by-products such as wood dust and chips can be further used for manufacturing increasing number of products or as a renewable energy source. Virtually all wood products can be re-used and recycled. This contribution is increasingly acknowledged by stakeholders and Institutions such as the European Commission[8].

Circularity and resource efficiency play a key role in the development of the forest-based bioeconomy, as it helps to reduce the pressure on forests due to increased biomass demand[9]. More synergies could be created, and the sector faces a number of challenges to further progress in the transition. Priority actions include:

- increase the mobilization of wood from **sustainably managed forests**;
- increase the resource efficient use of biomass while adding value for the woodworking industries by developing **new products based on wood-processing residues**;
- enhance the **durability** of wood-based products by treatment with preservative technical materials, while at the same time allowing for **final recycling** of the product;
- increase the use of **wood in construction**; in addition to the already mentioned energy and carbon-saving advantages, wood offers the possibility to reduce the overall material use and thereby the amount of waste generated in the construction sector, this entails research to overcome remaining technical and administrative barriers, as well as education and training on the technicalities of wood species;

7. IPCC, 2018: Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [V. Masson-Delmotte, P. Zhai, H. O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W.
8. "A sustainable European bioeconomy is necessary to build a carbon neutral future in line with the Climate objectives of the Paris Agreement. For instance, in the construction sector engineered wood offers great environmental benefits as well as excellent economic opportunities. Studies show that the average impact of building with 1 ton of wood instead of 1 ton of concrete could lead to an average reduction of 2.1 tons of carbon dioxide emissions over the complete life cycle of the product (including use and disposal". EU 2018 Bioeconomy Strategy, p. 5.
9. European Environment Agency Report No 8/2018. The circular economy and the bioeconomy. Partners in sustainability

- improve product design to **facilitate disassembly and recover** of biotic and abiotic materials (e.g. in furniture or construction products);
- introduce **renew and repair** schemes for durable products, such as furniture.

1.1.4. SUSTAINABLE WOOD INDUSTRY AND SOCIAL DIALOGUE

As explained in the paragraph above, the woodworking industry is already an important player in the transition to bioeconomy, and it is estimated to keep its role in the coming decades. At the same time, this growth potential is conditional upon the availability of skilled workforce. By means of example, 53% of the workforce in the UK timber industry is over 40 years old, and severe shortage of skills will materialize if the number of new entrants stays at current level [10].

Social dialogue initiatives aimed at strengthening cooperation of social partners on issues like work-place safety are key to improve the attractiveness of the sector: the agreement on formaldehyde exposure was reached in advance to any binding EU regulation, proving that social partners are committed to provide solutions. **Joint actions to retain the skills and attract young workers** are therefore a precondition for the industry to thrive in the future and contribute to a sustainable economic development.

On the other hand, the innovations brought about by the transition to the circular bio-economy will require **new skills**. For instance, modern sawmills are highly mechanized, highly technical, and highly efficient. Lasers guide logs on tracks that whip by at high speed, scanners determine how to customize and optimize cuts on individual logs, high speed digital cameras and sensors increase precision. These machineries allow sawmill to maximize the output of sawn lumber out of a log and therefore minimize waste. This shift to mechanization and computerization calls for an update of the workforce training and education.

This **systemic change should be addressed in vocational education and training policy** at all levels (EU, national and local), and the European Social Dialogue can provide a relevant platform for tackling the challenge through a joint effort of the social partners.

The point of view of EFBWW

What follows is a summary of an interview with Rolf Gehring, Political Secretary for Safety & Health in the Wood, Furniture and Forestry sector, European Federation of Building and Woodworkers (EFBWW). According to Mr. Gehring, the circular bioeconomy is a topic of growing importance within the framework of the EU Social Dialogue. There are several opportunities for EU Social partners to support and contribute to the circular transition of the sector. A first level of intervention, EU Social partners can provide a service to the respective members **spreading information** on the developments of policies and legislation at EU level and **creating awareness** in the respective membership bases. Secondly, they are actors of social joint initiatives that aim to contribute to the political decision process and ensure that the relevant policies and funding programs, such as Research and Innovation policies, meet the most urgent needs of the industrial sector for its development. Thirdly, they are platforms for **sharing good practices**. Concerning the last point, more initiatives should be promoted in order to bring to attention at EU level existing good practices at local and national levels.

10. Miller McKenzie, Presentation to the Perspectives & Challenges of the Woodworking Industries in Europe Lisbon, 30th November 2018.

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1.2. The framework in Italy

(by Centro Studi G. Tagliacarne and Confapi)

1.2.1. THE WOOD SECTOR

Structure of the sector and economic data

In Italy, the **active enterprises of the "wood supply chain"** (which includes the wood industry – ATECO 16.29.1 and the furniture manufacturing industry – ATECO 31.01) **are 51,933** (as at 31/12/2018) and make up 1.01 % of the total of active enterprises, with a regional weight ranging from about 2.25% in Valle d'Aosta to 0.62% in Lazio. In the North-East (*Emilia-Romagna, Friuli-Venezia Giulia, Trentino-Alto Adige and Veneto*) wood companies account for 1.37% of the total.

The added value of the entire wood supply chain (more than 11 billion euros in 2016) accounts for 0.77% of the national one and has grown by 0.01 percentage points despite the reduction in the number of companies. The provinces where the wood sector is more incisive are Monza and Brianza (3.04%), Pesaro and Urbino and Como (3.01% respectively).

In terms of added value and employment, it is the furniture industry – strictly speaking – that performs better. The added value is more than 7 billion euros against 4,670 billion euros of the companies processing the raw material. The wood sector employs 214,561 people in local business units. However, this sector underwent a contraction, moving from a total workforce of 6.53% in manufacturing in 2012, to 5.86% in 2016. **Furniture production is the most important sector also from the employment point of view**, with 142,036 workers, and an added value per employee that increased from about 44,000 euros in 2011, to about 49,000 euros in 2016.

Investments in tangible assets have increased despite the contraction of the entire entrepreneurial system in the wood sector (+ 0.13 percentage points). In 2016 they represented 1.48% of total investments. **The furniture sector is increasing its intangible investments**: in 2016 they accounted for 0.83% of total investments, compared to 0.64% of investments of wood processing companies. In the furniture sector, exports represented 2.12% of total exports in 2018, equal to 11 billion euro, compared to 0.41% represented by exports of processing companies.

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Figure 1:
Wood sector, Italy – Number of wood enterprises and their percentage incidence on the total economy by region. Situation as of December 31, 2011 and 2018
Source: Centro Studi G. Tagliacarne, based on data Unioncamere - Infocamere

	Unit			Unit		
Region	**No. of companies in the wood sector**	**Total no. of companies**	**% of companies in the wood sector**	**No. of companies in the wood sector**	**Total no. of companies**	**% of companies in the wood sector**
North-West	17.029	1.400.183	1,22	13.566	1.347.992	1,01
North-East	17.387	1.084.682	1,60	14.020	1.026.938	1,37
Centre	13.126	1.074.899	1,22	10.479	1.075.720	0,97
South and Islands	17.998	1.715.751	1,05	13.868	1.700.093	0,82
Italy	65.540	5.275.515	1,24	51.933	5.150.743	1,01

Figure 2:
Wood sector, Italy – Economic values and employment (2016); export (2018)

	Wood industry (Ateco code 16)	**Furniture manufacturing industry (Ateco code 31)**	**Total Wood supply chain**	**Total Economy**	**% Wood industry**	**% Furniture manufacturing industry**	**% Wood supply chain**
Added value (thousands of euros) 2016	4.670.556,00	7.027.734,00	11.698.290,00	1.516.345.260,00	0,31	0,46	0,77
Employees 2016	111.923,00	142.036,00	253.959,00	24.809.499,00	0,45	0,57	1,02
Wages (thousands of euros) 2016	2.245.011,00	3.949.240,00	6.194.251,00	668.152.432,00	0,34	0,59	0,93
Wages per employee (euro) 2016	20.058,53	27.804,50	24.390,75	26.931,31			
Added value per employee (euro) 2016	41.730,08	49.478,54	46.063,70	61.119,54			
Revenue (thousands of euros) 2016	12.941.676,00	21.647.306,00	34.588.982,00	2.950.803.271,00	0,44	0,73	1,17
Value of production (thousands of euros) 2016	12.968.646,00	22.004.012,00	34.972.658,00	2.181.546.750,00	0,59	1,01	1,60
	Wood industry (Ateco code 16)	**Furniture manufacturing industry (Ateco code 31)**	**Total Wood supply chain**	**Total Economy**	**% Wood industry**	**% Furniture manufacturing industry**	**% Wood supply chain**
Gross operating margin (thousands of euros) 2016	1.560.268,00	2.189.625,00	3.749.893,00	345.752.035,00	0,45	0,63	1,08
Purchase of goods and services (thousands of euros)	9.259.910,00	15.756.563,00	25.016.473,00	2.234.178.679,00	0,41	0,71	1,12
Gross investments in tangible goods (thousands of euros) 2016	462.259,00	789.911,00	1.252.170,00	91.001.217,00	0,51	0,87	1,38
Gross investments in tangible goods per employee (euro) 2016	4.464,33	5.880,51	5.264,05	5.647,76			
Exports (thousands of euros) 2018	1.893.880,92	9.829.400,07	11.723.281,00	462.898.983,41	0,41	2,12	2,53

Legislation for the sector

The Multiannual Law on Expenditure in the Agricultural Sector (Law 752/1986) is the first normative document in the forestry sector in Italy. It establishes the forest as a renewable resource with various functions in addition to the production of wood. The following Community Regulations also apply to this sector: Reg. 269/1979 and most recent ones - 1094/1988, 1096/1988, 867/1990, up to Reg. 2080/1992, which led to the CAP reform that made the forest and agricultural sectors inseparable. This regulation is a real forestry policy aimed at encouraging and improving the woodlands. It was subsequently incorporated into Reg. 1257/1999, which plays a key role in the sustainable management of natural resources.

The amendment of **Title V of the Constitution** keeps the protection of the environment under the competence of the State and assigns forest management to the Regions. The State-Regions Conference has ratified the agreement on the **Framework Programme for the Forestry Sector**, which aims at encouraging sustainable forest management to protect the territory and contrast climate change, also by activating and strengthening the productive aspect of the forest supply chain.

In 2006, through its **Forest Action Plan**, the EU set four objectives to be achieved over a period of ten years: environmental protection, strengthening the competitiveness of the forest-wood chain, improving the socio-economic conditions of workers, and strengthening scientific research. In 2018, the **Consolidated Act on Forests and Forest Supply Chains (Legislative Decree no. 34)** was issued, in which, in accordance with EU regulations, the forest heritage is recognised as part of the national natural capital and as an asset of public interest. The Consolidated Act promotes the sustainable management of the forest heritage, to be implemented through its productive use and the protection of biodiversity.

Organizations supporting the sector

Below, a non-exhaustive list of organizations supporting the sector:

- *Catas*, testing and analysis laboratory for the wood and furniture industry
- *Centro di formazione legno-arrendo* (Wood-furniture training centre) at Lentate sul Seveso
- *Cosmob Technology Centre*, laboratory and certification body
- *Istituto Alberi e Legname del CNR* (Trees and Timber Institute of del National Research Council)
- *Istituto per la Valorizzazione del Legno e delle Specie Arboree* (Institute for the valorization of Wood and Tree Species)
- *Polo per l'innovazione del settore legno-arredo POLM PALM Abruzzo* (Innovation Pole for the Wood-Furniture sector)
- *SISEF, Società Italiana di selvicoltura ed ecologia forestale* (Italian Society of Silviculture and Forest Ecology).

1.2.2. SOCIAL DIALOGUE

Italy has a multiform system of business representation. Businesses can voluntarily join employers' associations that sign **National Collective Labour Agreements** (Italian acronym: CCNL) with trade unions. The Italian law identifies the CCNL as the regulatory source through which the employment relationship is regulated:

- Unital-Confapi http://www.apito.it/it/download/Circolare_rinnovo_CCNL_Unital_18042017.pdf;

- Federlegno-Arredo-Feneal-Filca-Fillea http://www.federlegnoarredo.it/ContentsFiles/ACCORDO_RINNOVO_CCNL.pdf;
- CNA Produzione- CNA Costruzioni-CNA-Confartigianato Legno e Arredo- Confartigianato Marmisti- Confartigianato Imprese-Casartigiani-CLAAI-Feneal-Filca-Fillea http://www.filleacgil.net/images/cannata/LAPIDEI/2014_CcnlLegnoLapideiArtigiani.pdf.

In Italy there are three **associations representing the interests of companies in the wood sector**:

- Unital, Unione industrie Italiane Arredi Legno (Italian Industries Union for Wood Furniture)
- Federlegno
- CNA and Confartigianato Legno e Arredo (Wood and Furniture Business Association).

The trade unions in the wood sector are:

- FILLEA-CGIL – Italian Federation of Workers in Wood, Construction, Related and Extractive Industries, member of the CGIL
- FILCA-CISL – Italian Federation of Workers in Construction and Related Industries, member of CISL
- FENEAL-UIL – National Federation of Workers in Wood, Construction and Related Industries, member of the UIL.

The three unions are members of the European Federation of Building and Woodworkers (EFBWW).

Bilateral bodies are often the expression and result of social dialogue. They are private bodies made up of trade unions and employers' associations.

Social dialogue includes:

- joint observers
- continuous training and the establishment of Bilateral Bodies for training as provided for in the CCNL;
- guidelines for supplementary bargaining;
- second level agreements of some large companies.

In this context, some experiences somehow linked to "green social dialogue" should be mentioned:

- establishment of the Industry Bilateral Body (IBB) through the CCNL of the Food sectors – Industry, AIIPA, FAI- CISL, FLAI- CGIL, UILA- UIL contract with the task of analysing research investments to save energy and raw materials;
- establishment of a National Observatory, through the CCNL of the paper sector, which examines safety and ecology issues and waste sorting trends;
- establishment of the Bilateral Body for the CCNL of the cement, lime and plaster industry sector, which will address the issues of the circular economy in all 9 sectors of building materials;
- second level agreement for the workers of Barilla SpA to improve energy efficiency with a 10% reduction in consumption;
- second level agreement for the workers of Kraft Food Italia srl to reduce emissions by 25% through the reduction of waste and the introduction of new process technologies.

A European project supporting green social dialogue, must be mentioned: **"BROAD Building a Green Social Dialogue"**, led by the Italian Union Fillea CGIL between 2015 and 2017. The initiative aimed to make the construction sector a promoter of growth and sustainable development through social dialogue. The initiative saw the involvement of trade unions from four European countries, research centers and employers' associations with the aim of formulating guiding criteria to support social dialogue in green building at European and national level.

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1.2.2. SUSTAINABILITY, BIOECONOMY AND CIRCULAR BIOECONOMY

The first useful document to understand the political and legislative framework is the **Environmental Annex to the Stability Law 2016**. It contains provisions on: environmental impact assessment, waste management, blue economy, prevention of hydrogeological disruption, sustainable mobility and green procurement, and rules to encourage the reuse of materials.

In particular, Art. 206-ter *(Programme agreements and contracts to encourage the purchase of products derived from post-consumer materials or from the recovery of waste and materials resulting from the disassembly of complex products)*, provides that the MISE (Ministry of Economic Development), in agreement with the MATTM (Ministry of the Environment and for Protection of the Land and Sea) can enter into agreements and programme contracts with companies, public bodies, public or private entities, trade associations, associations of companies involved in reuse, preparation for reuse and recycling, etc.. It modifies article 83 of Legislative Decree 163/2006 by adding: "*... with the strategic objective of a more efficient use of resources and a* ***circular economy*** *that promotes the environment and employment*".

With the decree of 11 January 2017 and modification of July 2019 the adoption of **Minimum Environmental Criteria (CAM)** is dictated for the supply and rental service of interior furnishings. CAMs are the environmental requirements defined for the various stages of the purchasing process in the context of public procurement, aimed at identifying the best design solution, product or service from an environmental point of view. This obligation ensures that the national green public procurement policy is incisive not only in the objective of reducing environmental impacts, but also in promoting more sustainable, "circular" production and consumption models and in spreading "green" employment.

A clear direction towards circular economy is given by the adoption of ***the package of European Directives on waste and circular economy***, (in force on July 4, 2018). The new Directives of the package amend the six main EU rules on waste and are: Directive (EU) 2018/851; Directive (EU) 2018/852; Directive (EU) 2018/849 Directive (EU) 2018/850.

The objective of achieving a change towards a circular economy is achieved by increasing the reuse and recycling of urban and special waste, promoting repairs and leasing. With the receipt and adoption of the package of European Directives on waste and circular economy, **Italy should anticipate to 2025 the European target of 60% recycling** of urban and related waste now set at 2030, through a waste sorting exceeding 70%, and bring the reuse and preparation for reuse of usable urban waste to 10%.
In October 2017, in line with the commitments made in September 2015 for the United Nations Agenda 2030 for Sustainable Development, the MATTM drew up the ***"National Strategy for Sustainable Development"*** with the primary objective of improving socio-economic well-being conditions in Italy. This National Strategy mentions **circular and resilient economy to climate change as a new reference model**.

In July 2017, after the elaboration of the "*National Strategy for Sustainable Development*", the MATT and the MISE prepared a document entitled ***"Towards a circular economy model for Italy: framing and strategic positioning***" followed by ***"Circular economy and efficient use of resources - indicators to measure circular economy"*** of May 2018, which is a first operational proposal to define an Italian model to measure “circularity”.

Another document produced is the ***“National Strategy of Smart Specialization: development trajectories for the circular economy*”**, which identifies the priorities for investment in research, development and long-term innovation to build competitive advantages and sustainable growth.

In the last ***GreenItaly Report 2019***, by Fondazione Symbola and Unioncamere, Italy is indicated as the European leader in the circular economy and waste recycling. An indicator of the rate of “circularity of the economy” is provided by the rate of use of secondary materials compared to raw materials. With 17.1% of the total consumption of secondary materials (which also includes biomass and energy materials) **Italy has a performance far above the European average**.
As far as post-consumer wood waste is concerned, **more than 95% of wood waste is sent to plants for the production of panels for the furniture industry**.

On the bio-economy front, in 2016 the Presidency of the Council of Ministers promoted the ***“Italian Bioeconomy Strategy”*** (source: *La bioeconomia in Italia: Un’opportunità unica per connettere ambiente, Economia e Società- Bioeconomy in Italy: a unique opportunity to connect environment, economy and society*) involving several ministries, the Agency for Territorial Cohesion and the national technological clusters of green chemistry (SPRING) and the agro-food sector clusters (CLAN).
The Bioeconomy Strategy is part of the implementation process of the National Strategy for Smart Specialisation (national S3) and in particular of its thematic areas “*Health, Food and Quality of Life*” and “*Smart and Sustainable Industry, Energy and Environment*”, and is implemented in synergy with the “Italian Strategy for Sustainable Development” and its principles.
The “Italian Bioeconomy Strategy” (BIT) aims to achieve a 20% increase in economic activity and jobs in the Italian bioeconomy by 2030.
In Italy, the entire bio-economy sector, including agriculture, forestry, fisheries, food and beverage industry, pulp and paper industry, tobacco industry, natural textile fibres industry, biopharmaceutical and bio-energy industry, has reached a turnover of 250 billion euros in 2015, with about 1.7 million employees.
Italy plays a key role in the bio industry sector and it is leader in **biological resource-based chemistry**. In this context, important private investments have been made and significant projects have been carried out to convert industrial sites into bio-refineries for the production of organic products, particularly bio-chemical products, from renewable resources.
In this regard, our supply chain has a limitation: processed wood is converted into a few traditional products of low value, whereas **more significant spaces for the use of wood are represented by bio-construction**.

A comprehensive report on the degree of adoption of the 17 objectives of Agenda 2030 at national level comes from ***“The Budget Law and sustainable development. Analysis of the measures and situation in Italy with respect to the 17 Objectives of Agenda 2030”***, a document prepared by ASviS, yearly. Law 163/2016 – Reform of the Budget Law – introduced into the cycle of economic and budgetary planning 12 indicators of fair and sustainable well-being, selected among those of the Bes – Sustainable Economic Welfare – framework.

In May 2019 a decree was issued containing the *“end of waste”* regulation scheme for the recycling diapers, napkin pants and sanitary towels, modified in November 2019 by the Law 128 (2.11.2019) in order to

support circularity and to try to avoid 900 thousand tonnes of waste per year.
Future end-of-waste decrees are foreseen for the recovery of tyres, paper and cardboard, mixed plastics and building materials.

In October 2019, the **Climate Decree**, which represents a pillar of the Green New Deal – together with the Budget Law, the Environment Annex to the Save-Sea Law – provides for the approval of a *National Strategic Plan*.

Important initiatives in supporting sustainability and circular economy issues are:

- the Sustainable Development Festival - http://festivalsviluppososteniblie.it/2019/
- the BioInItaly Investment Forum
- the European Circular Economy Stakeholder Platform (ECESP) a circular economy actors' platform derived from ICESP - https://www.icesp.it
- the Forum nazionale sulla bioeconomia delle foreste (the National Forum on Forest Bioeconomy).

Relevant stakeholders such as institutions, agencies, associations, organizations are:

- *Ministry for the Environment, Land and Sea* - https://www.minambiente.it
- *Ministry of Economic Development* - https://www.mise.gov.it
- *Fondazione per lo Sviluppo Sostenibile* (Foundation for Sustainable Development) - https://www.fondazionesvilupposostenibile.org/
- *Circular Economy Network* https://circulareconomynetwork.it
- *Asvis* - Alleanza Italiana per lo Sviluppo Sostenibile (Italian Alliance for Sustainable Development) - http://asvis.it
- *Fise Unicircular*, Association of Circular Economy Enterprises - http://www.unicircular.org
- *CONAI* - Consorzio Nazionale Imballaggi - http://www.conai.org
- *Rilegno* - http://www.rilegno.org

It is worthwhile to summarise about **Rilegno**, that is **the consortium for the collection, recovery and recycling of wood packaging**. It operates within the Conai system (National Packaging Consortium) and has the task of guaranteeing the achievement of the objectives set by law for the overall recovery of post-consumer wood packaging such as pallets, boxes, crates, cages and reels for cables coming from both separate collection carried out by the municipal administrations and by the collection carried out by private operators in industries and large-scale distribution.
Rilegno carries out activities of: prevention of waste production, collection, recovery (extracting raw material from collected waste), recycling and reuse.
In 2019, in Italy, out of 3,165,000 tons of wood packaging released for consumption, over 1,967,000 tons were recovered and recycled (over 62%).

A sustainable reading of the wood and furniture sector [11]

Among the wood furniture companies that have made green investments (years 2012-2014), 23.4% recorded an increase in turnover; among the companies that have not made investments, this percentage drops to 17.6%, with a spread of +5.8 percentage points in favour of those making investments. Among the former, 37.2% exported their products, compared to 22.4% of the other group (14.8 percentage points of spread). 23.1% hired, compared to 10.1% in the other group.
Green investments drive innovation: 30.4% of eco-investment companies have developed new products

11. Extracts from: The Made in Italy dwells in the future, Symbola Foundation and FederlegnoArredo 2016

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or services, whereas only 18.0% of the others did the same (+12.4 percentage points).

The competitiveness of green choices (energy consumption, reduction of waste production and emissions into the atmosphere). As far as electricity consumption is concerned, the Italian wood furnishing sector has the best performance in Europe. Another important element is represented by air emissions, which for this sector show a reduction between 2008 and 2013: this 46.3% reduction shows a rate more than three times higher than the EU average (-13.7%) and in any case well above that of the top ten European competitors (-17.6%); 30.7% of the companies in the sector have made "green" investments. Green investments by type of investment concern: reduction in consumption, 58.1%; production process, 29.0%; product, 12.8%.

In the report by Symbola Foundation, the **ten innovation lines that mark the Italian way to circular economy are**:

1. ECODESIGN (use of biomaterials, new re-engineering and recovery services);
2. DURABILITY (mechanical durability, safety, resistance);
3. DISASSEMBLYING (possibility of replacing product parts);
4. INNOVATIVE BIOMATERIALS AND MATERIALS (e.g. biopolymers from castor oil);
5. RENEWABLE AND CERTIFIED MATERIALS (from sustainably managed forests; use of materials according to PEFC and FSC brands, etc.);
6. RECYCLED MATERIALS;
7. REDUCTION OF POLLUTING SUBSTANCES;
8. ENERGY EFFICIENCY;
9. REUSE AND UPCYCLING;
10. ENVIRONMENTAL CERTIFICATION.

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11. Extracts from: The Made in Italy dwells in the future, Symbola Foundation and FederlegnoArredo 2016

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1.3. The framework in Bulgaria

(By Bulgarian Chamber of Commerce and Podkrepa CL)

1.3.1. DESCRIPTION OF THE STRUCTURE OF THE SECTOR

Forestry has long traditions in the country and plays an important economic, environmental and social role. Bulgaria has diverse terrain and several mountains which are the main source of timber. The country is the third richest in biodiversity in Europe and forests have increasingly important environmental and recreational role.

Total forest land in Bulgaria is 4.25 MHA and it covers 37% of the country's territory. The latest inventory shows that forests cover 3.55 MHA or 90% of total forest land (source: *Agrarian Report, Ministry of Agriculture, 2019*). **Forests account for 31,6% of the national territory which ranks Bulgaria 19th in Europe.** The forest land has grown and in 2018 it was 8.8% more than in 2000 (3.91 MHA) and 18% more than 1985. The European ecological network Natura 2000 coveres 4.1 MHA or 34.9% of the country's territory /2015/. About 48% of the forest territories (2.0 MHA) are in Natura 2000 which are subject to special timber harvesting rules.

Forests are divided in two major categories – timber producing forests with 1.59 MHA (38%); and protective, recreational and in protected territories forests with 2.63 MHA (62%).
Most of the wooded territories are state owned – 73% of their total area. The non-state -owned wooded territories are 27%, including owned by municipalities (13%), by physical and juridical persons (11%) and by religious organizations (3%).

Main problems of the Forestry in Bulgaria are *(National strategy for development of the forestry sector in Bulgaria, 2021-2025)*:

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- Low labour productivity;
- Lack of mechanization and underdeveloped forest road network;
- Difficult access to financing;
- Lack of opportunities for using finances from the EU structural funds for investment in renovation of equipment in logging, machines, production lines and transport of wood production;
- Insufficient involvement (support) of the banks in the investment projects;
- Low share of certified forest territories and certified forest entrepreneurs;
- Illegal logging and poaching.

The lower share of timber producing forests and the expanding of recreational/protected forests have reduced the potential for more intensive timber production and have made sourcing of local timber more challenging and expensive.
In Bulgaria there are about 3000 registered juridical persons doing logging. 400 of them are active in this field. Most of the workers in these companies have concluded a civil contract. Small wood-processing enterprises usually have own teams for logging. **The state of the logging firms is alarming**. Main reasons are the extremely unfavourable conditions, under which the production process is realized – low productivity, old equipment for logging and transporting of the timber, low level of education and qualification of the workers (National strategy for development of the forestry sector in Bulgaria, 2021-2025).

The wood-processing and furniture industry in Bulgaria (Forestry industry) includes two sub-sectors – Wood-processing and Furniture manufacturing.

The **Forestry industry can be evaluated as a perspective economic branch**, having in mind the presence of sufficient raw material resource, sustainable internal and external market positions of the manufactured products and their significance as a source of incomes and employment for large part of the population in the mountain and rural areas.
The territorial distribution of the enterprises from wood-processing and furniture industry refers to the mountain areas of the country, where the main sources of raw timber concerning forest area, timber reserves are focused. Thus wood-processing enterprises are located mainly in the regions of the Balkan Mountains, Rhodope and Rila-Pirin.

The enterprises for manufacturing the end timber-based product – furniture, joinery, wood assembled constructions and houses, are positioned mostly in the large consumer centres.

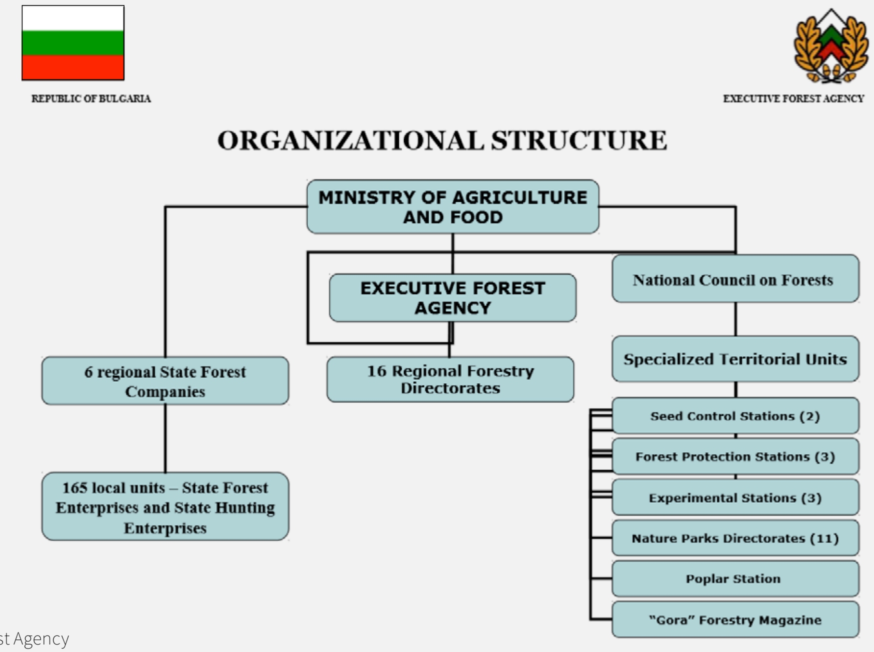
Production of raw timber and timber-based products is directly related to the furniture manufacturing. **Furniture industry produces about 2.6% of the total GDP of the country**, a little less than 10% of the industrial GDP and over 20% of the GDP in the processing industry. According to statistical data, over **97% of the firms in the furniture sector in Bulgaria are SMEs**. The manufactured products, depending on the object of activity, include hotel furniture, office furniture, kitchen furniture, framed furniture, upholstered furniture, tables and chairs, tubular furniture.

Within these sectors leading trade partners of Bulgaria are:
- Export of timber and its products, except furniture – Greece, Turkey, Italy, France, Macedonia.
- Export of furniture – Germany, Czech Republic, Great Britain, France.

1.3.2. INSTITUTIONS, LEGISLATION, POLICIES

Forest Sector Organizational Structure and Administration

Organizational structure of the forest sector includes the Executive Forest Agency under the Ministry of Agriculture, food and forestry with 16 regional forest directories and a National Council of Forests. There are several specialized territorial units such as 2 seed control stations, 3 forest protection stations, 11 nature park directorates, and a poplar station.
The economic functions in the sector are performed by 165 forest enterprises (or often called forest farms) and 28 state hunting enterprises united in 6 regional state forest companies.
The Executive Forest Agency performs policy and control functions, carries out forest inventory, supports private forest owners through an extension service, coordinates erosion and forest fire management, provides nature park management and seed control.



Source: Executive Forest Agency

Forest Legislation and Strategy

The main legislation is the **"Forest Act", 2019**, with more than 20 implementing regulations. A further law is the "Hunting and Game Management Act" with one implementing regulation. There are also the "Regional Plans for the Development of Forest Territories".
There are several strategic national documents which outline the framework for the development of the sector:

1. The *"National Strategy for the Development of the Forest Sector 2021-2025"*
2. The **"Strategic Plan for the Development of Forest Sector 2014-2023"** which defines 20 Operational Goals. For the implementation of the Goals 102 Actions are planned and a total amount of appr. 200 000 000 EUR is allocated.

Other important documents are:

- The "National Development Program of Bulgaria 2020";
- The "Third National Climate Change Action Plan 2013-2020";
- The "National Action plan for Energy from Renewable Sources";
- The "National Long-Term Program for Promotion of the Utilization of Biomass for the Period 2008-2020".

The above documents establish **longer term goals for the development** of the forest sector such as: sustainable development through an optimal balance between the ecological functions of the forests and ability to provide long-term material benefits and services; enhancing the role of forests for an economic growth and more balanced social-economic development; and increasing the contribution of the forest sector in the green economy.

1.3.3. SUSTAINABLE, CIRCULAR BIO-ECONOMY AND SOCIAL DIALOGUE

Both social dialogue and circular bio-economy are considered as crucial for a sustainable development in the wood sector. Unfortunately, under the pressure of economic factors, the policy pursued in Bulgaria at national level, for decades, to preserve, develop and expand the forest has been abandoned. At the same time, post-communist deindustrialisation significantly reduces the processing potential of the country and it is mainly orientated towards exports of raw wood – which has its negative impact on both sustainable development and value added and capitalization of the sector.

Industrial relations do not adequately relate to sustainable development issues. The challenge now is to link sustainable development to key matters like: competitiveness of the Bulgarian wood processing industry, forestry management systems, standard of living for forest workers employed in the processing industry, natural heritage conservation matters.

A significant problem is the energy dependence of the country and the high prices of other sources of energy, leading to the felling of forests even for house heating. In recent years, an overall increase in Bulgarians' average per capita income and the overall, albeit slow, improvement in the quality of life has increased the cost of timber; there is a need for even more active woodworking activities, making an effort to strengthen the sector's resilience.

Social Dialogue in the Wood-Processing Sector

There is a **collective agreement between regional businesses and trade unions in the wood-processing sector updated lately in 2018**. It is for 2 years and has been renewed regularly after respective negotiations. The contract applies for the whole country. It covers the following ambits: wages, safety and health at work, working time and breaks and social events. The minimum wage, minimum daily subsistence allowance and minimum hourly wage have also been agreed in its text. The agreement includes an article for night work and an article for emergency situations, for example fire. The collective agreement stipulates that the employer provides advice and consultation on the worker's professional qualification.
The employer must assure healthy and safe working conditions. Each year, the employer arranges health checks for the workers. There are also clauses concerning the requirement for provision of water and food to workers in case the outside temperature is above 30 degrees C.

Working hours and breaks – depending on the work experience, each worker is entitled to up to 10 days of additional annual leave. Workers have extra days if they get married if they donate blood or if a close person has perished.
For social events, like teambuilding, Christmas party, etc. there is a fixed amount. Such events have been organized 2 times a year - joint employer and syndicate events for trade union members.

With a view to the "Green Deal" the design of the new social dialogue will also focus on environmental sustainability as a means for improvement the working and life conditions of the employees.

The benefits described above are due to good social dialogue at national and enterprise level. Unfortunately, **many Collective Agreements still lack the link between good results and environmental sustainability. In Bulgaria the importance of environment and the impact of the work of enterprises on it is gaining momentum.** More and more employers anticipate and attach importance to the environmental sustainability but clauses about this in collective agreements are still missing.

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1.4. The framework in Portugal

(By AIMMP)

1.4.1. THE WOOD SECTOR

In Portugal, there are around **6 000 companies** active in the wood sector, as per the CAE REV.3 *(Código das actividades económicas – Revisão 3* – Economic activities code – revision 3) classification below:

- *Division 16 – Manufacture of wood and products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials;*
- *Division 31 – Manufacture of furniture*
- *Division 32 – Other transformation industries.*

The wood sector represents **8% of the overall manufacturing industry** in Portugal. 51% of the active companies are situated in the north region and 26% in the centre region of the mainland. 87% of the companies employ less than 10 workers which is a standout characteristic of the sector's size distribution (see Table 1).

The wood processing sector employs around **60 000 workers, exports approximately 3 000 million euros per year** and shows **a positive trade balance of nearly 1 000 million euros**.

The sector represents north of **0.7% of the Portuguese Gross Added Value (GAV)** and **around 2.6% of the GDP**. Companies within division 16, generally referred to as 1st transformation industries, represented a GAV of 817,6 Million Euros by 2018, employing 29 748 workers Furniture industry, in 2018, showed a GAV of 625 Million Euros, employing 33 770 workers. Both 1st transformation of wood and furniture industry presented a positive GAV evolution of 2,5% per year, between 2010 and 2018.

Table 1:
Sector relative weight on the Portuguese economy
(MC – Micro Companies; SMC – Small and Medium Companies; BG – Big Companies)
Note: The grey cases identify the most relevant classes in each segment / indicator

Indicator	Dimension	SNF	Wood, Cork and Paper	Forestry	Wood and furniture	Cork	Paper
Nº of Companies	MC	89,5%	80,9%	91,0%	78,5%	81,0%	62,0%
	SMC	10,3%	18,7%	8,9%	21,3%	18,3%	34,4%
	BC	0,3%	0,4%	0,1%	0,1%	0,6%	3,6%
Business Volume	MC	15,4%	11,1%	47,4%	13,8%	13,4%	1,8%
	SMC	41,7%	39,3%	44,2%	60,2%	45,1%	21,2%
	BC	42,8%	49,6%	8,4%	26,0%	41,5%	77,0%
Workers	MC	27,7%	23,4%	49,8%	23,8%	17,9%	7,1%
	SMC	44,9%	57,6%	43,2%	63, 7%	51,5%	51,5%
	BC	27,4%	18,9%	7,0%	12,5%	30,6%	41,4%

1.4.2. SOCIAL DIALOGUE

According to the European Commission, social **dialogue refers to 'discussions, consultations, negotiations and joint actions involving organisations representing the social partners – employers and workers'.** Social dialogue is the dominant feature of collective industrial relations in Europe, as the Commission Communication the European social dialogue, a force for innovation and change (COM (2002) 341) of 26 June 2002 acknowledges.

Social dialogue in Portugal, was kept, remarkably, with a strong presence before, during and after the crises period between 2008-2015. Although the general consensus has been sometimes hard to achieve, all social partners were heard concerning the majority of the decisions that were taken.

However, the changes to collective agreements negotiations, made by the Portuguese government in the crisis period (2010-2015), with special regard to the "freezing" of sectorial collective negotiation, increased tensions, and starting some obstacles to the recreation of a negotiation tradition, that had existed previously.

The main objective of the Portuguese government, and subsequent legislation aiming to decentralize the collective sectorial agreements, and therefore trying to strengthen the negotiation at a company level was not reached.

In general, the collective agreements still establish terms and conditions that are equal or just slightly above to the minimum requirements demand by law, especially in what concerns salaries. The content of most of the collective agreements, with some recent significant exceptions, apparently was practically unaltered when we compare the periods before and after the crisis. This represents the need to revitalize the negotiation culture and make the collective agreements more dynamic and representative of the current challenges in what concerns the labour market for all sector of the economy.

Social dialogue between industry representatives and trade unions, headed to the revision of the collective labour contract in force since 2012, has focused mostly on wages, working hours and the need to effectively comply with the obligatory training hours. These are, also, the main discussion topics of the negotiation for the collective labuor contract between the Portuguese Industry Configuration (CIP) and the union federations.

There is a major opportunity for social dialogue to focus more on the development of careers based on the adequate definition of professional categories and relevant criteria to fulfil that. Through this, worker valorisation would be focused on its personal qualification and not only on its occupation and the solely definition of minimum wage threshold for each occupation.

The tripartite agreement of May, 30th of 2018, could constitute an important milestone in the reactivation of a stronger negotiation culture. This agreement aims to ensure the principal concerns of all parties, manly the hour bank and the compensation for supplementary work. It establishes new rules concerning the lapse and renewals for collective agreements, what is expected to bring a more dynamic result for the negotiations.

Main Sector social partners in the wood sector are:

- AIMMP – Associação Industrial da Madeira e Mobiliário de Portugal
- SETACOOP – Sindicato da Construção, Obras Públicas e Serviços Afins.

There is a collective agreement for the wood sector signed between AIMMP and SETACOOP (trade union for construction, public works and related tasks), published on *Boletim do Trabalho e Emprego* (work and employment journal) (BTE nº 9 from 08/03/2011) that establishes the basis for the work relations in the sector.

There are some updates that were made in 2012 concerning the salary grid, and the inclusion of some new professional categories not covered in the earlier versions. And in 2016 there was the start of a new round of negotiations, that are still not concluded.

1.4.3. SUSTAINABLE AND CIRCULAR BIO ECONOMY

Considering that the core definition for bio economy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food, pulp and paper production, and also the exploration of the forest resources. Portugal has 35% of its soil occupied by forest area, being only 5% considered as urban territory (National Forest Inventory nº6).

Portugal is striving forward a sustainable and circular bio economy, in order to reduce waste, and also to have a more competitive economy, so that it can face the new future challenges.

The Portuguese "Commitment to a Green Economy" (CCV) establishes a strategic plan for a sustainable future, where economic growth goes hand in hand with responsible environmental behaviour, thus contributing to social justice and quality of life of today's populations and of future generations.

When considering the evolution of social dialogue in the wood sector in Portugal, and also the effort that is being made in what concerns sustainable and circular economy, there are some crucial assumptions that we have to consider in order to achieve the desired outcome:

- the economic growth of the wood sector is directly connected with both legislation and new initiatives in the means of production;
- the increase of bio economy activities and the reduction of waste, will increase Portuguese companies' competitiveness,
- the increase in competitiveness will have a strong impact on work relations, and promote the social dialogue between all partners, in order to achieve even better results;
- the changes predicted for the wood sector, will only occur by the combination of factors of having a better and motivated workforce, combined with new approaches in management, and also reducing context costs such as waste and the use of recyclable materials.

In conclusion, the wood sector in Portugal needs to embrace change towards an even more sustainable economy, considering its goal do maximize natural products, and the proper exploration of forests, in order to maintain its growth in a sustainable manner. Therefore, the main goal is to put together the best practices in the sector, and also by benchmarking other relevant sectors in the Portuguese economy, in order to obtain the maximum desirable outputs in the valour chain, to make its economy and also it´s companies, to be better suited for maximize raw materials, considering the bio economy as a mean towards a bigger end.

Core legislation and policies

As mentioned above **The National Strategy for Adaptation to Climate Change** (ENAAC 2020) was adopted by the Portuguese Government on April 2010 (Government Order no. 24/2010, April 1st). This Strategy sets the ground for the need for adaptation, through a synthesis of the main observed changes in the climate over the 20th century and a summary of the conclusions of climate scenarios and projections for Portugal. ENAAC is structured around four objectives:

- **Information and knowledge;**
- **Reducing vulnerability and increasing the response capacity;**
- **Participation, awareness raising and dissemination;**
- **International cooperation.**

The Strategy identifies nine priority sectors, which are connected to nine sectorial working groups. On the priorities, forest and forest sector are aggregated with agriculture and fishing, its measures are organized on measures, and objectives such as:

- Promote forest sector resilience throw management practices;
- Reduce forest space vulnerability to biotic and abiotic risks;
- Ensure the sustainability of direct and indirect productions and services;
- Increase the knowledge about potential impacts and capacity to apply effective adaptation measures;
- Promote exchange of knowledge between science and forest practice;
- Monitoring of ecosystems reaction to climate change;
- Monitoring the adequacy of policies, plans and instruments.

In Portugal the **Strategic Framework for Climate Policy** (QEPiC) was approved by the Government Order no. 56/2015. The QEPiC aims are:

- Promote the transition for a low-carbon based economy, creating more wealth and employment, and enhancing green economy through the Commitment to a Green Economy (CCV);
- Ensure sustained reduction on the emissions of greenhouse gases (GHG), in order to comply with

the energetic efficiency (in 2030 minus30% in reference to the energetic baseline) and renewable energy sources (in 2030 at least 40% of the energy final consumption);
- Reinforce resilience and the national capacity towards adaptation;
- Ensure a committed participation on international negotiations and cooperation, complying with international commitments and support developing countries in the domains of mitigation and adaptation to climate changes;
- Promote research, innovation and the increase of knowledge;
- Promote social involvement on climate change challenges, enhancing the rise of individual and political actions;
- Improve the efficacy of the information systems, of the reports and of monitoring;
- Ensure the conditions to financial support and increase investment levels, namely by the efficient allocation of the subventions under the Portuguese Carbon Fund (FPC) ;
- Ensure governance and the incorporation of climate aims on sector domains as foreseen, namely, by the National Plan for Climate Change (PNAC 2020/2030) and the National Strategy for Adaptation to Climate Change (ENAAC 2020).

In 2018 the prospect is for the increase of production (pellets), the reduction of imports and the increase on exports, mainly resulting from the higher production. There is also a renewed interested in dedicated plants, with government decision to launch a special regime for an additional of up to 60 MW biomass plants (each with no more than 15 MW) – Decree no. 64/2017 of 12th July.

In summary: the goal for strengthening a circular bio economy in the wood sector in Portugal can be made possible by the combination of increasing social dialogue and new styles of management, in order to achieve a better prepared economic growth for all stakeholders.

Reflections by the Portuguese Minister of Environment João Matos Fernandes [12]

Companies worldwide increasingly recognize that one of the problems they will face in the medium / long term is associated with a shortage of raw materials. Therefore, Matos Fernandes – Portuguese Minister of Environment – assumes that “if we persist in a linear model” – based on the extraction of raw materials, the production of goods based on these materials and their elimination – “we will have a future that is not abundant. And, either the resources will be very expensive and, as a result, there will be serialization for the price and necessarily there will be more excluded, or we have to make another option.

This “other option” is the circular economy where “there is no loss of well-being, no loss of access [to goods], there is a loss of ownership, with gains for businesses because they can have relationships of trust with your consumers. And with gains for consumers, because they only pay for what they use, without having to buy the goods to have at home,” explains João Matos Fernandes. In this model, there is a transformation: consumers stop buying all the objects they use and pay for their use. Drills and other types of machines that are used sporadically by families may be some of the examples.

For companies, on the other hand, this model also requires a change. For many it may mean no longer selling a product to sell a service, but it may also mean

12. In Dinheiro Vivo, 2018-04-07, www.dinheirovivo.pt/economia/economia-circular-pode-criar-36-mil-postos-de-trabalho-12681348.html

that the products have a longer "life", and there is a bet on repair instead of replacement. Matos Fernandes believes that part of the change goes first to companies. "Many of these things start with the business model and the design of the products themselves. Ecodesign is the design of products designed to last longer so that they can be repaired and remanufactured. Once and for all, let's stop saying in our homes that the heater and the toaster has broken down and it's better to throw it away than have it fixed. This is a work that begins naturally with the manufacturer".

In Portugal, companies, says the Environment Minister, are aware of the advantages that this model brings. Although "I have no doubt that there is work to be done here and there are sectors where this will be more evident than in others".

Last year, the Ministry of the Environment, through the Environmental Fund, allocated one million euros to support projects in this area. There were "many competitors" and the "money was all spent". For this reason, explains Matos Fernandes, "this year there are several warnings, some already closed, others opening in the short term, very focused on the industry" – plastics, the construction sector and the public sector – but also for people and for people. communities. In total, the Portuguese government, through the Environmental Fund, will make available this year 5.35 million euros, of which part – 350 thousand euros – is destined to the protocol with the Coordination and Regional Development Commissions (CCDR) for the development of regional agendas for the circular economy.

In the circular economy plan published in December last year, the government points out that the impact of implementing measures for the circular economy in Europe could lead to an 11% increase in European gross domestic product by 2030. In the case of Portugal, The Environment Minister notes that the effects can be felt, in particular, on job creation. "The numbers we have are relatively conservative. Our expectation, for example, is to create 36,000 direct jobs from the realization of the circular economy action plan" by 2030, he adds. "But the Business Council for Sustainable Development (BCSD) has now put out a job where only 32 companies have found that a very large share of these 36,000 jobs can be created very quickly."

Circular economy. What distinguishes it from recycling? For many, at first glance, the circular economy, and the goal of reviving products, can be confused with recycling. Still, the concepts are different. Matos Fernandes, Minister of the Environment, explains that "the circular economy is a model that regenerates resources instead of depleting them". But it also argues that it is necessary "to have an economy model where goods retain their greatest economic value for as long as possible. This requires much more than recycling. To recycle is to unite the tips of this linear economy". Stressing that recycling "is of the utmost importance", the official considers "it is fundamental" that things change with this economic model. This is because currently only 9% of the raw materials that are extracted are used more than once.

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THE OPINION OF STAKEHOLDERS

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2.1. The panel at Eu level

2.1.1. INTRODUCTION

This report is based on a focus group meeting held in Brussels on the 08th of October 2019, aimed at collecting experts' opinions and experiences on the challenges of the transition of the woodworking industry towards the circular bioeconomy. The focus group was hosted by CEI-Bois, the European Confederation of the woodworking industries, in the frame of the EU Social Dialogue Project "Good Wood". The meeting was attended by Mr. Patrizio Antonicoli (CEI-Bois), Mr. Diego Benedetti (European Organisation of the Sawmill Industry), Mr. Johan Elvnert (Forest-based Sector Technology Platform), Ms. Ingrid Hontis (Fédération belge de l'industrie textile, du bois et de l'ameublement – Fedustria), and Ms. Margherita Miceli (CEI-Bois). A written contribution was submitted by Mr. Rolf Gehring (European Federation of Builders and Woodworkers).

The discussion was guided by two macro-questions:

1. *How will the transition to the circular bioeconomy affect companies and workers in the woodworking sector?*
2. *How can the social dialogue platform facilitate the transition by supporting companies and workers?*

A synthesis of the conclusions reached in the discussion is reported below.

2.1.2. OPPORTUNITIES AND CRITICAL ASPECTS FOR COMPANIES AND WORKERS

In order to frame the issue correctly, it is important to remind that the woodworking industry is already a building block of the European Circular Bioeconomy. The forest-based industries[13] as such provide an industrial ecosystem where materials, by-products and residues are supplied across the various parts of the value chain, to make the most efficient use of everything resources and to maximise the climate change mitigation impacts of the total system. **According to the JRC, the woodworking and furniture industries account for 8% of the total turnover and value added of the bioeconomy**[14]. If we consider the forest-based sector at large (including forestry and pulp and paper industry) the share increases to 19% of the total added value and 8% of the added value.

Moreover, a significant part of the flows of woody biomass in Europe is already circular through cascading use (73 Mt in 2015). Post-consumer wood and by-products (like chips and sawdust) represent an important part of wood consumption in the EU that will grow in the future. For example, the usage of recovered wood has reached on average 40% of raw material needs in the European particleboard industry, with some countries using recovered wood for up to 90% of their wood procurement.

At the same time, when looking ahead, the sector faces some challenges. Some of those have been identified by participants.

- **The technological advancement level of the industry is not uniform across Europe.** This translates into a different degree of labour intensity across the different Countries. For example, in the Eastern European Countries, the industry is much more labour intensive than in the Nordic countries. This means that potential for increased mechanisation remains high. A shift in this direction will entail an increased demand for skills of workers, staff and

13. That is, the woodworking, pulp and paper, printing and furniture industries, according to the definition of the European Commission Staff Working Document (2013) 343 final.
14. Joint Research Centre Knowledge Centre for the Bioeconomy, Briefs on Jobs and Growth of the Bioeconomy 2009-2015.

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entrepreneurs, and for an upgrade of professional profiles (e.g. mechanical engineering profiles will be more and more sought after).

- **The technological change is an ongoing process and will affect products**, used materials and work processes. This may lead to new forms of risks (new materials and combination of materials) or, on the other hand, can reduce existing hazards at workplaces.
- **The structure of the wood industry also differs across Europe.** For instance, in Central-West Europe 80% of the workforce are employees, while this share decreases to 40% in South-west and South-East Europe[15], where the average size of companies is smaller and family-owned businesses are still numerous. Although differences among countries and sub-sectors exist, **a consolidation trend is also observed, with a restructuring of the industry towards fewer but bigger companies**. Integration is also a well-established trend in Nordic countries, where the biggest wood-based biorefineries are based. In the Scandinavian countries for example small and medium non-integrated wood products manufacturers co-exist along integrated production plants using biomass to produce wood products, pulp and paper, bio-based chemicals, biofuels, electricity and heat. Participants agree that consolidation usually entail better labour organisation and improved conditions for workers, but also recognize that the family-owned business model provides advantages in terms of dedication of workers. Participants also agree that, despite the general market concentration trend, **market niches for small enterprises will still exist and small businesses will retain profitability**, for example by focusing more on export markets or driving the trend of product customisation.
- **New business models can appear and traditional value-chains may face changes**; new niches for manufacturers or traders may appear. The above pointed changes can have a substantial impact on needed skills. Therefore, labour market vocational education systems and companies (their internal training units) are faced with the need to anticipate changes and integrate new skills in existing training structures and to upgrade the qualifications of the current workforce.
- **The challenge of retaining existing skilled workers** and attracting new talents will be faced in all parts of the sector and across the continent. At the same time salary level imbalances across EU member states may worsen such difficulties in certain parts of Europe.
- **On the regulatory side**, the EU ambition to be trail-blazer in the global fight against climate change by committing to climate neutrality by the mid-century may entail a loss of competitiveness due to increased regulatory burden, unless measures to correct possible imbalances and **to ensure that the transition is carried out in a socially fair way** are put in place. At the same time, the transition to the circular bioeconomy provides opportunities for the sector and European companies and workers in general. For example: abundance of biomass in East Europe offers a significant bioeconomic development potential, provided that the right governance and policies are in place (see for example the BIOEAST initiative, www.bioeast.eu). The use of structural funds in those areas can be targeted to infrastructural advancements (e.g. forest roads) that will facilitate the development of industrial value chains and of value creation.
- **The sector, in general, will have (the chance to) growing positive reputation in the society.** The latest spring of youth activism in climate change

15. Source: ForestEurope, State of Europe's Forest Report 2015.

issues may also result in a stronger orientation towards sectors that provide bio products and that contribute strongly to a circular economy.

- **Skills opportunities can result in individual growth and better career opportunities for workers.** The changes in technology, products and production processes might also offer opportunities for new forms of work organisation and better working conditions.

- **The shifts towards fully circular value chains will also offer employment creation opportunities.** One example is the current trend of increased reuse and refurbishment of furniture products. Initiatives to set up Extended Producer Responsibility schemes are also gaining ground in Europe (for instance, Belgium will launch a compulsory EPR scheme for mattresses starting in 2021, and further initiatives concerning the furniture sector might follow) and will provide job opportunities at all levels for collection, sorting, and processing activities, as well as other supporting roles such as reverse logistics. It is likely that changes in this direction will materialize in the next 10-15 years.

2.1.3. THE ADDED VALUE OF SOCIAL DIALOGUE

Participants agree that in order to successfully meet the above-mentioned challenge joint action by employers and workers is needed. Social partner can play an important role on all levels, company, sectorial and European level.
Anticipating and assessing technological change in the industry is essential in order to tackle the so called "skills-gap" and to define the new needs of the labour force. Adaptation mechanisms should consequently be put in place to address the skills-gap, but also the increasing shortage of skilled workers in the production sector.

To this aim, collaboration with Social Partners is key to strengthen ties among schools, universities and companies. European sectoral social dialogue in the sector is a key platform to spur initiatives to develop and upgrade skills in the sector, for example by joint initiatives to strengthen the VET system.

Their role in this respect is at least threefold, i.e.

a) the exchange of information, of good practices and the support of communication within the sector:
b) the active influence of the societal and legal framework
c) the active joint support of companies in managing the change (projects, guidance and agreements). By doing this, the social partners also take their responsibility to contribute to a level playing field for all economic activities in a growing circular economy.

Awareness raising is also a joint area of discussion and work for social partners: local communities should collaborate with the industry and the trade unions to improve the image of the sector and communicate to society the importance of forests and Forest-based Industries while showcasing the correlated innovative and sustainable character. As an example, the woodworking sector is working on improving its communication to young generations and has launched joint initiatives with Social partners at EU level to tackle the issue through the joint project "Perspective and challenges of the woodworking industries in Europe". In particular, it has started a study on the perception of the sector that also aims to issue concrete recommendations on how to bridge the gap between the industry and young workers (for more info, see http://pcwie.com).

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2.2. The panel in Italy

2.2.1. INTRODUCTION

In Italy, the panel involved: 3 trade unions, 1 employers' association, 2 companies, 1 sectoral consortium, 1 research and training centre, 1 accreditation and training centre. Some stakeholders expressed their opinions through a focus group [16] and in-depth analysis via e-mail/phone; with some stakeholders only a telephone interview was carried out [17].

The main questions asked within the focus group were:

1) *Development of sustainable economic models in the wood sector: what are the opportunities and critical issues for companies and workers?*
2) *In this context, what is the added value of social dialogue?*

The individual interviews gave the opportunity to follow up the questions and/or to listen to the specific experience of that organization.
This chapter 2.2. proposes a summary of what emerged both in the focus group meeting and in some individual interviews, while the specific experience of four organizations is reported in the annex to this chapter.

2.2.2. OVERALL REFLECTIONS

First of all, the listened stakeholders shared some overall reflections.

The development of sustainable economic models in the wood sector should be understood as a **shared vision and responsibility** between: companies, workers, their representatives, and institutions.

Social dialogue on this issue is most effective in its "tripartite" form, with the involvement of employers' organisations, trade unions and institutions. The institutional level involves the 4 levels: EU, national, regional, and municipal [18].

Similarly, to what can be said for other sectors, the development of the wood sector in a sustainable way can be implemented through the interlinking of four factors:

- Regulatory and fiscal framework
- Increased awareness and cultural change at various levels
- Organizational innovation and business practices
- Effective and fair communication to consumers.

For some years now, the social partners in the wood and construction sector have been aware of the "green" challenge at national and European level. They are aware, for example, that the use of wood in construction, combined with its reuse/regeneration, makes it possible to minimize the impacts of construction processes, and enhance the performance properties of wood and its derivatives also in terms of energy efficiency.

On the other hand, as far as the circular economy in the construction and wood sector is concerned, **there is still a lack of adequate investment in research and development**.

In general, there is also a shared view that **international agreements in the environmental field are not very effective**.

16. The meeting was held on 30 May 2019 at Confapi.
17. The interviews are in separate sheets, attached to this report.
18. In Italy, there are also local clusters of wood-furniture that are actors of social dialogue. Think, for example, of the wood-furnishing district of Pordenone, actor of a second level supplementary contract.

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2.2.3. OPPORTUNITIES AND CRITICAL POINTS FOR COMPANIES

Sustainable development is increasingly considered by companies as an (existing or, in any case, potential) opportunity in terms of market and competitiveness, organizational well-being, reduction of energy costs, access to finance, and corporate reputation.

Support to companies in adopting environmentally sustainable models is fundamental:

- to strengthen **awareness and skills** (culture of sustainability)
- to strengthen **research and development also for SMEs**, investing in technologies, machinery, new materials, innovative processes that reduce processing waste and energy use
- **interaction with the territory** and its stakeholders
- the activation of **partnerships/company networks** to exploit industrial symbiosis

→ use the **tax leverage** to the benefit of investing companies; these companies must be granted clear incentives, stable over time, to support the transition

→ to **leverage the reputational aspect** for the market (for example: the combination "Made in Italy-sustainable product" is a winning one for product competitiveness, in the medium and medium-high brackets)

→ define clearer, less cumbersome, less changeable **technical regulations/rules**

→ to introduce mandatory **environmental certifications and measurement** systems that allow the consumer to unequivocally assess the "environmental quality" of the product.

2.2.4. OPPORTUNITIES AND CRITICAL ISSUES FOR WORKERS

The main reflections that have emerged are:

- a company that adopts principles of corporate sustainability is a **safer company**: this element can be the starting point for a strategy of sharing between company and workers
- it is important to act with a view to the recognition of **workers' environmental rights**
- Sustainability requires participatory organisational and production models that enhance the **co-responsibility of management and all workers**.
- the question arises of **adjusting wage levels** in the light of new skills/responsibilities of workers (remuneration of new and widespread responsibilities of workers)
- the occupational risk due to the lack of skills must, of course, be tackled with both **initial and continuous training** which is a need and a resource; constantly updating technical skills and enhancing transversal skills such as problem solving, teamwork, the ability to take responsibility, and flexibility
- The sustainable development is a positive factor in **increasing the attractiveness**, of the sector, especially for the younger generation.

2.2.5. THE SOCIAL DIALOGUE PERSPECTIVE: RECOMMENDATIONS TO FOSTER ENVIRONMENTAL SUSTAINABILITY IN THE WOOD SECTOR

The stakeholders who participated agreed on the following recommendations:

- to strengthen social dialogue to win a challenge that concerns a shared responsibility between employers and workers
- to foster the cross-sector perspective, "setting rules for the supply chain", promoting unification/harmonisation of contracts

- to support “extended environmental responsibility”, it is essential to include “sustainability clauses” in contracts, from the national level up to the company level, acting along the entire chain of processing and use of materials
- integrative (second level) bargaining is a fundamental catalyst to “hinge” “green” product/process innovations, to push companies to invest and reason on the economic returns of sustainability: more efficiency, less waste, greater responsibility towards the territory, greater competitiveness.
- European-level agreements can play a crucial driving role, but they must be accompanied by extensive information, awareness-raising and training measures at national and local level.
- the social partners, united, can promote decisive project partnerships, encouraging experimentation, practices and voluntary codes that can bring along the necessary cultural change
- social partners are called upon to build consensus on the values of environmental sustainability, acting together to improve the effectiveness of communication and awareness raising among all stakeholders
- social dialogue is a key driver for action on legislation and policies at EU level
- legislative and governing bodies at national level must be urged by the social partners both to promptly and effectively transpose European directives and to adopt incentives rewarding good companies and workers
- social dialogue must be strengthened in a tripartite form - by fostering dialogue with institutions at all levels, also by setting up steering committees to promote projects and experiments
- social dialogue must activate joint pathways for entrepreneurs and workers: information, training, exchange of experiences, co-definition of models and processes
- social dialogue can act effectively to promote actions in the educational and cultural field, through lifelong campaigns and initiatives, starting from primary school.

APPENDIX – INDIVIDUAL INTERVIEWS

INTERVIEW WITH IMOLA LEGNO spa [19]

(www.imolalegno.com)

IMOLA LEGNO is a company with 138 employees; it is an importer, distributor and processor of wood-based raw materials.

With regard to the issues related to the GOOD WOOD project, the company’s approach is revealed in the statements of the interview with the two company representatives: “In our industry, a company must necessarily protect the sustainability of woody raw materials, as wood is unique for its versatility, aesthetics and regeneration speed. Wood has accompanied human life and its sustainable management is indispensable for the balance of our planet. The protection of natural resources is everyone’s responsibility and we are convinced that business decisions and ecologically responsible behavior can coexist”.

With reference to the production process and certifications, the company is “FSC” and “PEFC” certified and has specific drying cells, suitable to carry out thermal wood treatments (HT/ISPM 15), essential for the export of packaged products.

All panels (multilayer/chipboard/mdf) have the appropriate certifications (“CARB2”, “EPA”, “E1”) which strongly limit the formaldehyde content in the various products.

The company pointed out that the certifications, in particular the FSC one, provide for the active involve-

19. We thank Mr. Fabrizio Berrettini and Mr Pierangelo Morini interviewed in June 2019.

ment of all employees, who are all involved in the 'chain of custody' of wood.

The entry into force of the EU Timber Regulation ("EUTR") was fully supported by this company, which, as an importer, carries out assiduous checks on suppliers so that they, in turn, comply with the rules on timber logging and sustainability of forest resources.

In recent years, the company implemented a selection of its suppliers, especially in some areas of the world, and cancelled at least 50% of them, as they did not meet the certification requirements.

The company recognized that in recent years some large groups of the large-scale retail trade that follow every single step in the product transformation, in compliance with the certifications and for the maintenance of the chain of custody ranging from forest management to the finished product, gave an important input to the whole industry.

"Every new product we introduce must comply with very strict requirements and must last as long as possible. The last product we introduced, ACCOYA (a name identifying acetylated wood), is an example of this. It is FSC/PEFC certificated, and naturally treated in special cells; it is guaranteed 50 years for outdoor use and 25 years in constant contact with water and soil. It does not require disposal, and at the end of its cycle, which lasts longer than what guaranteed, it can generate heat, through combustion, in a completely natural way".

With reference to energy consumption and logistics, the company has a photovoltaic system covering the entire production process needs and uses only combustion from processing waste to heat water or the environment. Therefore, it does not use any type of fuel. Logistics is based exclusively on rail or ship transport, avoiding excessively polluting road or air transport.

In order to increase handling effectiveness, efficiency and sustainability, IMOLA LEGNO founded a logistics company to manage, among other things, the operation of private railway tracks that reach the plants.

With regard to market competitiveness, company representatives pointed out that "the market does not always appreciate our selective efforts, which imply a higher cost of raw materials; however, we believe that it is only a matter of time, correct social communication, and education in the use of sustainable products.

When we work within Europe, or with the United States, which are markets that demand guarantees in this respect, we 'play on equal terms'. Competitiveness, when we play with 'the same weapons' (same level of protection and quality), is dictated by business efficiency. In fact, it is difficult or impossible to compete in countries or with countries that have not developed the same criteria of respect and wise management of forest resources and work quality protection.

Our choice however, is to follow a more responsible, even if difficult path, respecting the environment. Sustainability is our trump card to win our commercial challenge, increase our exports to the most advanced markets, for example the United Kingdom".

With reference to the importance of specific agreements between undertakings, the company underlined the importance of agreements with suppliers: "As a result of well thought-out and strategic choices, we have the same view of our suppliers, who have the same

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sensitivity to environmental issues, and with whom we share specific codes of conduct for the protection of raw materials".

In addition, the company pointed out that in Italy, at present, alliances for sustainability are a primary need also in the distribution sector: "We believe that the market is still too fragmented and therefore agreements between companies with the same sustainable vision should be sought and facilitated, in order to give impetus to environmental sustainability in our industry". **In conclusion, the company highlighted two areas in which the government should act to encourage and support companies that undertake innovations for environmental sustainability:**

1. **Administrative/regulatory simplification: to date, the amount and timing of bureaucratic requirements often complicate the implementation of innovations in plants (e.g., the time needed to obtain permits for plant extensions).**
2. **Tax incentives for responsible companies.**

INTERVIEW WITH COSMOB [20]

(www.cosmob.it)

The COSMOB Technological Centre was founded in 1983 by institutions and companies from the wood-furnishing district of Pesaro. The Centre offers a wide range of services to companies: laboratory tests and product certifications, regulatory support, digital design and manufacturing, quality control, initial and continuous technical and specialized training courses, production optimization, supplier control, innovation support, national and international research and development projects, advisory services on internationalisation. Since 2019, COSMOB is officially a Product Certification Body, accredited by Accredia (Italian accreditation body) according to the international reference standard UNI CEI EN ISO/IEC 17065:2012, which defines the requirements for competence, impartiality and proper functioning of Certification Bodies.

Some overall considerations on sustainability and circularity challenges for businesses

In the last three years, the restrictions imposed by the American regulatory body EPA (Environmental Protection Agency) on the emission limits of harmful substances in the parts and assemblies of furniture products have been highly topical. These restrictions have imposed on all exporting companies an immediate adjustment in their supply of raw materials, with complex organizational and management interventions to be carried out in the very short term. Obviously, this regulation had an initial direct effect on panel manufacturers and led to supply difficulties in 2018. Undoubtedly, in this and other areas of regulation, small companies are experiencing greater difficulties in adapting, **also in terms of information collection**.

SMEs need targeted assistance, with approaches differentiated according to the type of product and clientele (whether components or finished products, for private or public customers), also in **communication** activities.

In general, the challenge of sustainability of materials and processes is very complex for small companies in the wood furniture industry and specialist advice is essential, especially in support of certification processes.

Eco-design is particularly challenging, if we consider, above all, disassembly characteristics.

20. Thanks to Alessio Gnaccarini, Director.

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It is crucial to expand **multidisciplinary research** and **cross-sector cooperation**, areas on which COSMOB has chosen to make a strong commitment, for example, through projects in collaboration with the automotive sector (projects on glue, paints, weather resistance) or with the construction sector (plants that absorb pollutants) or with the nautical sector (light materials), or with the fashion/textile sector (reuse of materials, eco-fabrics).

Reflections on some certifications

Among the different certifications on which COSMOB provides assistance, we briefly analyze two of them: one that we could define “basic” – the *Minimum Environmental Criteria (CAM) Certification* and one that we could define “borderline”, recently launched – the Circularity Mark. On both we offer some food for thought to companies on benefits and complexity aspects.

1) Verification of compliance with the Minimum Environmental Criteria (CAM) Regulation for Furnishings

CAM are defined within the framework of the “Plan for the environmental sustainability of consumption in the public administration sector” and have been adopted by Decree of the Minister of the Environment. In Italy, the effectiveness of CAM has been ensured by art. 18 of Law no. 221/2015 and, subsequently, art. 34 containing “Criteria of energy and environmental sustainability” of Legislative Decree no. 50/2016 56/2017, which made it mandatory for all contracting stations to apply it. The minimum environmental criteria to be respected are related to hazardous chemicals and harmful emissions (formaldehyde, VOC), as well as the materials used to make the product (plastics, coatings, padding) and the requirements of the final product that must comply with the latest versions of the relevant UNI standards on durability, size, safety and robustness. COSMOB offers companies a concrete support in the preparation and organization of the necessary information. It starts with an AUDIT IN THE COMPANY (which provides: training at the various responsibility levels for the management of regulation requirements; documental check, product sampling); then LABORATORY TESTS are carried out (tests related to the product; tests related to component materials; issue of “Test Reports”). Once the tests have been passed, the company can obtain the certificate that will be subject to renewal, after periodic monitoring and verification.

2) Circularity mark

The “fundamentals" of the circular economy say that the resources used for an activity must be made available again to the system to be reused. To achieve this objective, it is necessary to develop appropriate monitoring that, in parallel with economic quantification, can assess quality, quantity and types of resources used throughout the supply chain and for the life cycle of the product or service. The evaluation must consider purchase, production, packaging and transport phases, use and reuse methods, maintenance, durability and frequency of use. The recovery and recycling phase must be efficient, in order to avoid dispersion of resources or depreciation and degradation of the materials used with respect to their original value and characteristics. During the design phase, it is more necessary than ever to apply ecodesign strategies to evaluate the life cycle of the resources used and identify environmentally and economically efficient solutions.

Cosmob has elaborated its own operating regulations – “Cosmob Qualitas Praemium - Product Circularity Assessment” – which constitutes an efficient logical method of verification, to favour the achievement of set results. The planned activity can be characterized by different levels of in-depth study, and is divided into: DATA ANALYSIS, with the elaboration of a preliminary technical report; AUDIT IN THE COMPANY which foresees various phases: A) product circularity assessment in terms of efficient use of resources; B) product economic circularity assessment; C) proposals to improve the efficient use of resources utilised with respect to product life cycle; D) Evaluation of possible circular reference scenarios for a more competitive product. E) Verification of the communication process of environmental claims in accordance with ISO 14021.

For both the certification paths described above, benefits are due, first of all, to the achievement of **a high competitive level by companies**: if, on the one hand, products must be validated from different points of view such as eco-sustainability, safety, durability and ergonomics, on the other hand, the achievement of these certifications allows companies to set up communication and marketing campaigns based on specific recognizable elements, to which the market, especially the international one, is particularly sensitive. All this, therefore, means that companies can be placed in a different market segment from those competitors that rely exclusively on low production costs.

The aspects of greater complexity for the companies are linked to their size characteristics, as companies in this sector are, for the most part, micro, small and medium ones. Therefore, **it is of fundamental importance to provide advanced technological services for technical and management support** in the implementation of certification paths that create competitive value on international markets.

INTERVIEW WITH CONLEGNO [21]

(www.conlegno.eu)

CONLEGNO is a private non-profit Consortium founded with the aim of protecting forest heritage and biodiversity, promoting the use of wood, from raw material to packaging and structural wood; it manages 14 Brands at national and international level, 13 of which are owned by the Consortium. All brands and services are oriented towards sustainability.

The issue of sustainability in the wood supply chain and the importance of obligations and certifications

Italy is poor in forest resources, supplies come from abroad, mostly from Austria, where there are large sawmills.

The introduction of Regulation (EU) No 995/2010, which sets out the obligations of operators who place timber and timber products on the market, including traceability and control of suppliers, may generate critical issues. The small raw material supplier is not informed and often does not have the appropriate accompanying documentation to export its products. In addition, also the buyer has difficulties in assessing the correctness of the documentation provided.

The phytosanitary issue (ISPM n.15, FITOK) is also part of the requirements.

In general, Italy is a quite virtuous country as concerns regulatory requirements; the same cannot be said for the rest of Europe. This confirms the importance of standardization and compulsoriness at European level.

However, the environmental certifications represent a positive fact. For example, the wood used in the building industry is guaranteed by a national certification that has a positive feedback, based on our professionalism recognized by the market even abroad.

21. Thanks to Davide Paradiso, Business Manager and External Relations of CONLEGNO.

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The FSC/PEFC certifications are recognized by global markets and facilitate trade, even the large-scale retail trade often requires certified products.

Circular economy

It is implemented primarily through the EPAL international product brand standard – a German-derived standard – which requires pallets to be made from recycled wood and to be reusable indefinitely, new or repaired.

EPAL is a standard identifying the pallet interchange system. The European Pallet Association e.V. (EPAL), is responsible worldwide for the quality of EPAL pallets placed on the market, thanks to a system of controls carried out by an independent third party. In Italy, it is represented by CONLEGNO EPAL Technical Committee.

For this type of activity and in general, companies must be trained and supported and this is also the role of CONLEGNO (in relation to its services).
Often, companies are rather unprepared for sustainability; if they make use of training activities, they prefer technical training.

CONLEGNO has no particular experience of working with the trade union side on circular economy and sustainability in general.

INTERVIEW WITH CATAS [22]

(www.catas.com)

CATAS was founded in 1969 in the district then known throughout the world as the home of chair and furniture components. The Institute was founded by the Chamber of Commerce of Udine to help local companies expand internationally on new foreign markets and adapt to technical product standards, both nationally and internationally. In addition to the accreditations recognized by ACCREDIA as an accredited testing laboratory (ISO/IEC 17025) and product certification body for the Formaldehyde CARB and EPA certification schemes (ISO/IEC 17065), CATAS enjoys various recognitions from public and government bodies such as Italian reference ministries (Ministry of the Interior and MISE-Ministry of Economic Development), US government agencies (CARB and EPA) and international manufacturers' associations (BIFMA). The large number of tests carried out every year on materials and products for the wood-furniture sector and the active and constant participation of its technicians in all national (UNI) and international (EN, ISO) standards Boards in the sector, make CATAS a privileged technical observatory on current needs and developments in the sector.

Circular economy - CATAS point of view

For some time now, the concept of **circular economy** has been appearing with increasing insistence in many areas, but this year has seen an important acceleration, **with the technical standards bodies at the forefront**.

In our sector, both the Technical Committee for wood-based panels and the Furniture Committee are taking a firm stance on the subject. We are in the early stages, there are a number of terms, aspects, consequences that need a systematic approach to define reference schemes to sort things our and proceed in a systematic way.

Our leading principle is to be able to define, find and measure quantitative indices establishing an objective and shared metric.

At present, we are well advanced in evaluating fundamental parameters such **as indoor air quality** (closely related to furniture and building), the **durability of fur-**

22. We thank the director of CATAS - Andrea Giavon - for the interview.

niture (EN/ISO technical standards) and the extent to which these aspects and their consequent choices (to be rightly defined as sustainable) affect the **use of resources** (LCA). CATAS is working hard on these frontiers, also participating in standards boards.

Indoor air quality

Indoor air quality in living environments (homes, offices, schools, hospitals, ...) is today receiving special attention, as a consequence of an increased awareness on the health and safety of consumers and the environments in which they live or stay. Among the substances used in the production processes of our sector, **formaldehyde and volatile organic compounds** are recognized as one of the main sources of danger and impact on the human health and on the environment. Formaldehyde, an extremely volatile substance, declared carcinogenic to humans (IARC, the International Agency for Research on Cancer, 2006) is still widely used in our sector today, particularly in the production of wood-based panels. In order to limit and control its use, test methods and emission limits have been developed and adopted over the years, providing the market **with defined tools and rules to verify and declare the conformity of raw materials and finished products**. This is in fact one of the few areas in our sector regulated by specific legal obligations. Italy, like other European countries, has made the exclusive use of low formaldehyde emission panels mandatory (class E1, Decree of the Ministry of Labour, Health and Social Policies no. 288/2008). Other countries outside Europe have adopted similar measures, in particular the USA, which in recent years acted as protagonists in this field: in 2009, the California Air Resources Board (CARB) issued a legislative regulation limiting the emissions of formaldehyde from wood-based panels, in 2018 the American EPA - Environmental Protection Agency introduced the regulation on emissions of formaldehyde from composite wood products which, in fact, extends these limits to all the United States. According to these regulations, access to the U.S. market requires manufacturers to obtain a **third-party certification**, officially authorized by CARB and EPA, and which includes the performance of inspections at plants and periodic laboratory tests.

Volatile organic compounds (VOCs) are substances contained in various wood-based products (from furniture to construction products) and in finishes applied to the surfaces of walls, floors, doors, furniture etc. International technical standards made available reference methods for the measurement of VOC emissions (e.g. EN ISO 16000-9). As concerns requirements and emission limits recognized and shared at European level, we can today refer only to EU Regulation No. 305/2011 on construction products, which includes, among its basic requirements, also emissions of harmful substances from materials. Some member states, e.g. France and Germany, have issued their own specific regulations on indoor emissions that manufacturers must know and respect in order to freely export some construction products (e.g. flooring) to these countries. There are also some national voluntary certification schemes for low emission products in Europe, but each of them proposes its own requirements for testing and evaluating results.

This complex and diverse situation can today represent a major obstacle for manufacturers who export their products to different European markets, as well as a possible source of disorientation for consumers in the process of choosing and purchasing products.

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Durability of furniture

In this regard and from the beginning, all the technical standards on furniture have addressed both product safety and its durability related to the intended use. With the regulatory tools now available (EN standards in the first place, but also ISO standards), durability is an indicator of resource saving.

The use of resources

In recent years, there have also been strong and widespread signs of interest in environmental product declarations in the furniture sector. In this context, the certified environmental product declaration EPD (Environment Product Declaration) represents one of the reference tools, based on the analysis of the product life cycle according to the LCA - Life Cycle Assessment method to guarantee the objectivity of the assessments carried out. LCA is a structured and standardized method at international level (ISO standards, 14040 series) that makes it possible to quantify the potential impacts on the environment and human health associated with a good or service, starting from the consumption of resources and emissions, throughout the entire life cycle of the product. On this issue, CATAS has recently started to develop new business support services, proposing itself as technical supplier for the application of LCA analysis to furniture production.

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2.3. The panel in Bulgaria

2.3.1. INTRODUCTION

Transition to circular economy is vital to overcome the complex economic, environmental and social challenges faced by the society. As highlighted by the priorities set out by the European Commission, transitioning from the current status quo of linear business models to circular approaches is a key objective for the EU in its journey towards sustainability. The implementation of innovative production systems moving towards circularity will not only result in benefits for the society, but it will also provide numerous new opportunities for companies. Innovations help the private sector to affect positively the economic growth, to reduce the negative impact on environment and create more jobs. They will in fact generate substantial net material cost savings for businesses.
As per the Work Programme of the European Commission 2019-2021 on social dialogue, circular economy is one of the outlined six priorities.
The wood-processing sector in Bulgaria makes its first steps in the introduction of circular economy. A circular approach in this sector needs a change in the characteristics and priorities of the business and production models and also a new orientation of the social dialogue.

The Bulgarian Chamber of Commerce and Industry (BCCI) was the first organization in Bulgaria that promoted in 2000 the Directive on Eco-Design, which is the starting point of circular economy.

For the implementation of the "Part 2" of the research carried out within the Good Wood Project, the Bulgarian Chamber of Commerce and Industry and the Confederation of Labour "Podkrepa" applied two methods to involve stakeholders in the wood-processing industry, to enhance their pro-active attitude towards circular bio-economy and eco-social dialogue, and to gather their views. These two methods were: a round table discussion during a national meeting and some interviews.

The focus in the discussions was on the following topics:
1. The main obstacles and challenges in the introduction of bio-circular economy in the wood-processing sector in Bulgaria
2. The impact of bio-circular economy on: the further development of the sector, the social dialogue in the sector, the managers and employees in the sector.

National Meeting

The BCCI and the CL "Podkrepa" organized on 26th of June 2019 the First National Meeting of the stakeholders in the wood sector in Bulgaria.
23 people participated in the event representatives of the:
- Forestry branch
- Wood processing sectors
- Furniture industry
- Project partners

The round table focused on bottlenecks, challenges and opportunities concerning introduction circular bio-economy in forestry and the wood-processing sector. Particular attention was paid to the link between circular bio-economy and social dialogue in the sector, and to the impact on the company managers and on the workers in the wood-processing sector.

Interviews

In addition to the National meeting, Bulgarian Chamber of Commerce and Industry and the Confederation of Labour "Podkrepa" conducted 5 interviews.

The respondents in the interviews were representatives of sectorial organizations and of trade union sections in the wood-processing sector, who are active in the social dialogue.
In their capacity of collective organizations, representing the enterprises in the wood-processing sector, the representatives of the sectorial organizations expressed the collective opinion of their members.
The representatives of the trade unions focused on the impact of circular bio-economy on the social dialogue in the wood-processing sector.
The questionnaire for interviews includes the following main questions:

- *What are the challenges and bottlenecks in the wood-processing sector?*
- *Are the circular approaches introduced in the sector and to which extent are they applied?*
- *What are the main aspects of circular bio-economy in the wood sector?*
- *Are managers and employees in the wood-processing enterprises prepared for the introduction of circular economy?*
- *What's your opinion about the effect of circular bio-economy on the social dialogue in the sector?*
- *Do you have any suggestions about the introduction of circular bio-economy in the wood-processing sector?*

Both partners – the Bulgarian Chamber of Commerce and Industry and the Confederation of Labour "Podkrepa" conducted interviews with the following stakeholders:

- The President of the Bulgarian Branch Chamber of Woodworking and Furniture Industry
- The President of the Bulgarian Furniture Cluster
- The President of the Bulgarian Wood Users Association
- The Head of trade union section on collective bargaining – Southwestern State Enterprise – TP Forestry Blagoevgrad
- The Head of trade union section on collective bargaining – Southwestern State Enterprise – TP Forestry Gotze Delchev.

2.3.2. OUTCOMES

The main outcomes of the National meeting and of the interviews are summarised below.
Concerning, deficits, obstacles, barriers, bottlenecks and challenges, the stakeholders mentioned:

- Low labour productivity
- Difficult access to financing
- Few opportunities in accessing to the EU structural funds for investment in renovation of equipment in logging, machines, production lines and transport of wood production
- Insufficient support on behalf of the banks in the investment projects
- Low share of certified forest territories and certified forest companies
- Weaknesses of the policies and of the strategic framework for the sector
- Deficit of sustainably-sourced, quality and price competitive raw materials, especially hardwood
- Energy efficiency, energy costs of the final production are twice higher compared to the EU average energy costs
- The wages are the lowest in the EU which is a competitive advantage but it also makes the industry unattractive for skilled workers
- Production costs are higher compared to the average for the EU
- Insufficient technology investment, innovations, R&D etc.

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The main suggestions for the improvement of the situation in the wood sector in Bulgaria are:

- the sector needs a restructuring and consistent reforms to face the accelerated globalization and the higher competition
- efforts should be made to reach sustainable market positions
- there is a need of consistent labour strategy in the sector, aiming at more and higher quality jobs
- there is need of a vocational training strategy aiming at higher standards of qualification and professional skills on sustainability and circular bio-economy
- it is necessary to foster a pro-active attitude on behalf of the workers and their trade unions in policy making, implementation and monitoring
- the collective bargaining in the sector must be developed in the context of a "green social dialogue".

Proposals to support a wide introduction of circular bio-economy in the wood-processing sector:

- a high-level commitment, with long-term business perspectives. The implementation of circular economy business models requires a structural change within organisations. In this respect, top-management commitment is crucial. By viewing circularity as an economic opportunity, through strategies in favour of long-term planning and investment, top management can facilitate the transition towards circularity
- the personal commitment and the attitude of the workers is crucial for introducing a green and circular approach. Companies in which circularity is tied to social goals, ethics and spirituality can enhance staff engagement. Purpose-driven approaches are highly motivating for employees, and ultimately it allows companies to attract and retain talent, gaining productivity in a vibrant and stimulating environment, marked by a committed and motivated staff
- it is important to increase awareness on the point that a green and circular approach means to enhance competitiveness.
- though there is a consensus on the importance of circular economy, a more widespread implementation of circular business models is needed. The process needs new production approaches:
  – Adoption of product life-cycle approaches
  – Transparency and reporting of non-financial information
  – Relevance of achieving sustainability objectives (CSR strategies and UN 2030 Agenda)
  – Stakeholders' and consumers' awareness
  – Full understanding by all stakeholders of the concepts of value, circularity and their opportunities
  – Being aware of the potential to create new jobs
  – Ambition to leave a lasting and inspirational footprint.

Other reflections

Finding new business opportunities thanks to a green and circular approach is crucial, to maintain market share and revenues in a very competitive market. Forward-looking and innovative companies can gain competitive advantage over more static businesses, especially in the light of a growing consumer's awareness of sustainability matters.

A stronger involvement of all social partners for introduction of eco-aspects in the social dialogue for the wood-processing sector is needed, especially for:

- introducing eco-clauses in the collective agreements
- diffusing better environmental conditions in the sector that can positively influence the labour conditions, and the health and safety of workers
- answering to the new "skill-gaps" with additional continuous training, focusing on technology changes for a circular bio-economy approach.

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2.4. The panel in Portugal

2.4.1. INTRODUCTION

The United Nation's 2030 Agenda, adopted by world leaders in 2015, represents the new global sustainable development framework and sets 17 Sustainable Development Goals (SDGs). It is commitment to eradicate poverty and achieve sustainable development by 2030 worldwide, ensuring that no one is left behind.

The SDGs balance the three dimensions of sustainable development: the economic, social and environmental. They provide concrete objectives for the next 15 years, focussed inter alia on:

- human dignity
- regional and global stability
- a healthy planet
- fair and resilient societies
- prosperous economies.

The woodworking sector, in Portugal, is a paramount example of the cascading use of raw materials through the entire supply chain. **Nevertheless, there are numerous opportunities to enhance the acquisition and application of Circular Economy and Eco-design principles in the sector, mainly on the project and design phase, as well as, the innovative use of recycled and secondary products as raw materials.**

The companies active in wood working sector in Portugal, have a very traditional and familiar profile as well as a low average size distribution. The companies are dispersed all over the northern and centre regions of the country, playing a very important role on the fixation of population in low density areas, enhancing local business dynamics which potentiate the creation of jobs and the opportunity to apply measures for the sustainable management of forests, based on the need for medium and long term raw material supply security.

Simultaneously, the **high number of micro and small companies reveals a lack of proper scale needed to develop, disseminate and apply initiatives aimed at enhancing the individual skills of workers, improve management tools and managers' know-how, parallel to increasing environmental awareness from suppliers and clients**.

The research that led to the development of this report was based on face-to-face meetings with relevant stakeholders, as well as phone calls and informal conversations held beside events. Below are listed some of the stakeholders contacted:

- Carlos Ribeiro (Corporate Human Resources Director of Grupo Vicaima, S.A. (a large industrial company)
- Joaquim Cruz (Managing Partner / carpenter of Chapim Concept (a small carpentry)
- Mário Silva (Engineer in charge of Production and sales) of Marpires (a medium furniture company
- Diogo Luz (Senior Surveyor of Serração Santa Luzia (a small sawmill)
- Ricardo Andrade (Director of Finances and Human Resources at RIBADÃO – Sawmill and wood derivatives, S.A. (a medium/large company)
- António Magalhães, (Board of SETACCOP – Union of Construction, Public Works and Services

In the next chapters, an effort is made to summarize and structure the perspectives and opinions collected during the project activities in Portugal.

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2.4.2. OPPORTUNITIES AND CRITICAL ASPECTS FOR COMPANIES AND WORKERS

There were several aspects of convergence among the opinions gathered, which reflect the main points, that on stakeholders' view, can be improved or reformed and seen as opportunities for the development of the sector.

The key challenges identified by the stakeholders involved in the research are presented below.

The excess of legislation in Portugal (both European directives, and national laws), that can be overwhelming in some cases, concerning responsibility and liability for waste management. **Small companies are concerned** about not complying with all waste management legislation due to lack of clear information, preparation and qualification of their workers as well as management.

There are several examples of companies already implementing eco-friendly products using the main concepts of a circular bio-economy in order to maximize their products life cycle. They value, not only the economical aspect, but also the social responsibility, considering they must encourage their workers by giving meaningful examples concerning environmental protection.

Increase the number and adequacy of trainings available in specific areas, mainly aimed at innovative production tools and technologies, as well as planning and quality assurance. This could be done by enlarging the offer of small training courses that respond to the current needs of the companies.

A concept based on the life-cycle analysis approach is being implemented by some companies, taking form as "product custody" or companies being "custodians of their products". The ecological responsibility begins with the choice of raw materials, first transformation and production processes until the final product. All processes and materials shall be controlled in order to certify that the final product is compliant with an eco-design set of criteria, and that can be reused or recycled after its life cycle. These voluntary initiatives or market demands can promote a more responsible mind-set for companies and workers and with a clear conscience that they are contributing to a greener and circular economy.

The collective work agreement was published in 2012 and it is outdated at this point. There is a need to harmonize professional categories in the wood working sector, throughout Europe, in order to benefit labour dynamics within the communitarian market and clearly define skills and careers progression.

2.4.3. THE ADDED VALUE OF SOCIAL DIALOGUE

Social dialogue needs to be reinforced and strengthened in order to turn the current challenges into opportunities, both for workers and companies. Specific trainings aimed at improving the skills of workers and adapt it to emergent production techniques and technologies are demanded by companies as well as workers. Stakeholders recognized that the major strength of social dialogue is the prevention of social conflicts and also the possibility to adapt working conditions to a specific activity and the dynamics of the market. Also, it was referred the need to make all the necessary adjustments to improve the coverage of collective agreements to the numbers that existed just before the crisis period[23].

As we can see on the graphic below, there´s been an increase of workers covered by collective agreements,

23. See figure 1 next page

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but there's still a long way to go to achieve the level of coverage that existed in 2008.

The application, and negotiation of the collective agreements in Portugal, was strongly affected by the crisis period, since 2008 until 2015, and has been recovering ever since. Although it hasn't reached the level of coverage it had in 2008, it demonstrates that there are several measures being taken, and that it is an issue of vital importance for the economy as a whole.

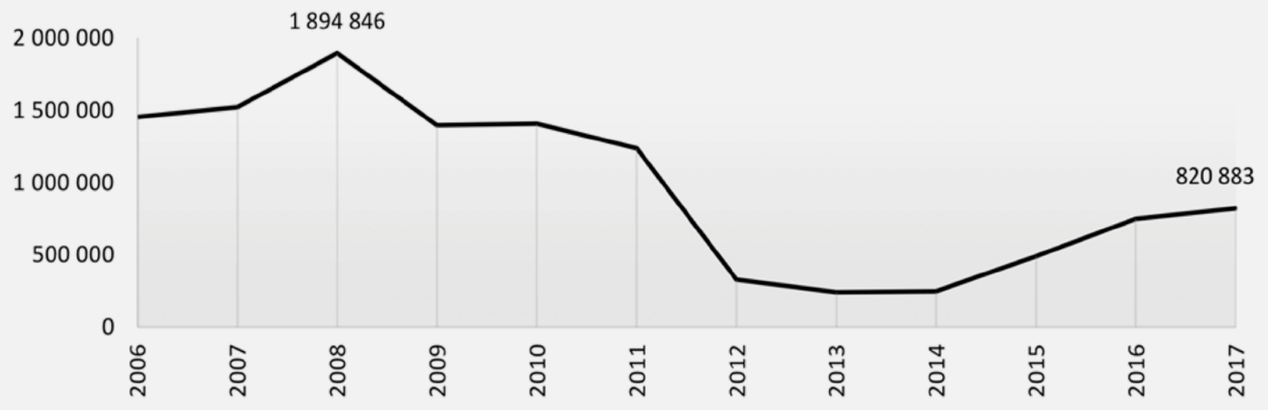
It was transversal to all interviewees that there is a strong need to conciliate the global economy with the defense of social rights, of negotiation rights, that will allow that all companies (from small to large) to be able to be more competitive. Therefore, social dialogue is often made at an informal level in some companies, in order to involve the workers towards a more awareness of the green economy, and the implications it can have on each company.

The bottom line is that if companies achieve cost reduction, adapt and incorporate in their actives a more environmental awareness, that will reflect on working conditions, and despite not being mentioned, it will have a positive impact on the wages of the workers.

Moreover, it was a generalised consensus that there´s a need to improve workers qualifications, through the combination of formal education, and specific training courses. This should be done with the collaboration of public employment agencies (IEFP), specialized training canters, professional schools, and universities. Since there are areas of knowledge that are transversal to all activities, and also to be able to incorporate in the training and educational system the current practices in the industry, and also to prepare for the new challenges towards new business models, and the incorporation of the concept of a circular bio economy that has to be regarded in an integrated way.

Another important aspect was the need to reinforce/reinstate collective agreements contracts in order to have a more competitive sector. Although, it was common ground there is also a strong need to make adjustments in what concerns workers job description and titles, in order to enable a more agile industry.

Figure 1:
Workers potentially covered by published collective agreements (new or renegotiated) in Portugal.
Source: Green book of labour relations – Ministry of Employment of Portugal



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EXAMPLES OF SOCIAL DIALOGUE FOR SUSTAINABILITY

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3.1. Introduction

Starting from the ideas and information shared with the stakeholders heard in the context of the project, the GOOD WOOD partners also aimed at identifying experiences of social dialogue on environmental sustainability for the wood sector. Searching for these experiences, a clear need for concrete projects emerged: the need for a stronger joint effort between social partners (employers and trade unions) for a "green and circular" wood sector. There is a need to strengthen the sectoral social dialogue in this area, to create models, tools, paths shared between companies / employers' associations and workers / trade unions, with the involvement, also, of local institutions.

In this part of the report, four experiences are briefly described that can offer concrete ideas and reflections for new actions.
The experiences were selected because they are the expression of a collaboration between employers and trade unions, in three priority areas, among those indicated by the stakeholders in the focus groups and in the interviews that we described in the previous part 2 of this report; in particular:

- the first experience, represents an example of a European level agreement that outlines a strategy of social dialogue and, at the same time, provides elements of operation and comparison that can be used by individual companies, with an active role of workers;
- the second, although concerning a production sector other than wood, is a case of second-level bargaining that includes sustainability objectives – a type of tool that the social partners heard recognize to be crucial to concretely implement sustainable and participatory business models;
- the third, offers a model of continuous training on corporate sustainability objectives, conceived thanks to social dialogue and which pursues the implementation of participatory measures by workers, management and stakeholders;
- the fourth, being a certification scheme works in several dimensions to promote cooperation between social partners aimed at beneficial work conditions at all levels whilst cooperating for an enhanced environmentally responsible production.

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3.2. The European Agreement on prevention of formaldehyde exposure

The “Autonomous Agreement on a European Action Guide regarding the prevention of formaldehyde exposure in the European panel industry and compliance with the occupational exposure limits" has been signed in 2018 among the European Panel Federation (EPF) and the European Federation of Builders and Woodworkers (EFBWW).

It represents an example of social dialogue at Eu level on a crucial issue for sustainability, and a joint effort to support a model of: mutual learning among European social partners, exchange of experiences between businesses, a participative approach within companies.

The Agreement is summarized in the template below; a follow-up interview to EFBWW is also reported.

Typology	Voluntary Agreement among sector’s social partners at EU level.
Period	The agreement has been signed on the 29 November 2018 and has a 3 years duration. It is the result of a joint Social Dialogue Project carried out by European Social Partners (EFBWW, CEI-Bois and EPF) between March 2017 and May 2019.
Aim	The aim is the proactive implementation of occupational exposure limits (OELs) recommended by the European Scientific Committee on Occupational Exposure Limits on formaldehyde. It anticipates the entry into force of Binding OELs by way amendment of the Directive 2004/37/EC. The Agreement sets minimum requirements applying without prejudice to European, national or sectoral regulations; the action guide is designed to be readily available for implementation to factories. The action guide sets requirements on workers participation and an action plan which includes a risk assessment, prevention measures, procedures to ensure compliance with the OEL and reporting procedures.
Geographical and sector coverage	Wood-based panel industries in the EU. The Relevant NACE sector is 16.21 - Manufacture of veneer sheets and wood-based panels. This class includes: manufacture of veneer sheets thin enough to be used for veneering, making plywood or other purposes; manufacture of plywood, veneer panels and similar laminated wood boards and sheets; manufacture of oriented strand board (OSB) and other particle boards; manufacture of medium density fibreboard (MDF) and other fibreboard; manufacture of densified wood; manufacture of glue laminated wood, laminated veneer wood.

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Social partners involved	European Panel Federation (EPF); European Federation of Builders and Woodworkers (EFBWW).
Social dialogue	The aim of the agreement is to promote cooperation between social partners at all levels whilst respecting different cultures in industrial operations. Its practical output is the improvement of the level of protection of workers in the panel industry. It is the result of a broader project aimed at identifying the challenges faced and solutions offered by the Woodworking industries and developing recommendations to the companies and workers involved.
Sustainability issues	Formaldehyde is a very well investigated substance; it belongs to the group of volatile organic compounds and can be released in the environment by natural processes such as forest fires or natural decay. In its industrial applications it however has a potential to cause adverse health effects and is therefore considered a hazardous chemical agent. Formaldehyde is applied in the production of various types of resin that are used as adhesives and binders in many industries, including woodworking. Since January 2016, Formaldehyde is classified as a carcinogen 1B according to the Regulation (EC) 1272/2008. It is therefore subject to EU Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens and mutagens at work. At the time the Agreement was signed, no harmonised limit for workplace exposure was set by European legislation. The updated Directive 2019/983 was adopted on the 5th of June 2019 and will be implemented by Member States in the coming years. Therefore, the Agreement proactively anticipated such changes relevant both for the industry and workers.

ON LINE SOURCES

- http://www.cei-bois.org/wp-content/uploads/2018/12/JPSD-35-Press- release.pdf
- https://europanels.org/wp-content/uploads/2018/12/Action-Guide-on-Formaldehyde-signed-on-28-Nov-2018-in-Lisbon.pdf
- http://www.cei-bois.org/2018/12/06/perspectives-and-challenges-of-the-woodworking-industries-in-europe-1st-training-workshop-on-the-european-action-guide-on-formaldehyde/

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FOLLOW-UP INTERVIEW WITH EFBWW ABOUT THE STATE OF THE ART OF THE "EUROPEAN ACTION GUIDE REGARDING THE PREVENTION OF FORMALDEHYDE"[24]

The interview collects both an overall evaluation of the Action Guide and a feedback on the implementation process, trying to highlight obstacles and advancements. The main results of the interview are summed up, by following the key-questions asked.

Q. Which are the main aspects of innovativeness and of added value of the European Action Guide regarding the prevention of formaldehyde, hereinafter the FA (Formaldehyde Agreement)?

The innovativeness and the added value of the FA can be seen from two perspectives.

From the political perspective, it brings an important concrete result for the EU social dialogue on a crucial topic for health and safety, fostering:

- mutual learning among European social partners
- exchange of experiences between companies
- a participative approach in planning and execution within companies, with an active, new role of workers in all steps: planning, executing, re-planning and informing
- collection of data at Eu level.

From a technical point of view, it provides: a concrete method for companies for implementing a continuous improvement in prevention and controls about formaldehyde.

Q. Which is the state of the implementation? What can be done to enhance it? Which are the critical aspects, if any?

We are still at an earlier stage in the implementation of the FA at national level. The FA is a voluntary agreement, not directly binding at national level, therefore now it must be negotiated at national level.

From a technical point of view, the main obstacles to implementation are linked to: language (i.e. a correct translation in all EU languages), measurement techniques (how, where to measure), awareness and skills at company level (management and workers); awareness and skills of social partners.

R. Gehring highlights that all the above critical points are now faced through a just started EU project. The project will provide: a technical translation of the FA in all EU languages; train the trainers seminars for workers; train- the-trainers for social partners.

From a political point of view, the critical point is the will of social parties to adopt the FA at national level. It is reminded that the FA proposes an approach that is consolidated in Germany (developed by the Paritarian Accident Insurance), i.e. this of the "Joint Health and Safety Strategy" where parties strictly coordinate their activities in the area of prevention.

Now for the FA, negotiations at national level is the key: it is a matter to use bargaining as a unique way to face a crucial challenge for health and safety.
For example, in Italy, as underlined by M. Landolfi, there would be now the opportunity to include the FA contents in the sector's collective agreement under renewal. E.g. A strong experience has been done, in Italy within the COVID emergency, where the Italian social partners agreed on very concrete and strict safety protocols, having a very important pro-active role toward competent Ministries.

24. The interview was organized by CEI BOIS and CSGT via web on 15.05.2020; EFBWW was represented by: Mercedes Landolfi (President, FILLEA CGIL, Italy and President of the Standing Committee Wood/Furniture/Forestry) and Rolf Gehring (Political Secretary Wood and OSH).

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Moreover, the critical point seems the deep impact on the company organization and in particular on the prevention and risks' measurement procedures. This obstacle could be overcome through the introduction of progressive /transitory measures, fixing ranges and, most important, setting a participatory approach in the action plan at company level.

Another key aspect is workers' awareness about the topic: they must be more and more informed and trained to become proactive stakeholders within the company.

Q. Could the FA represent a model of cooperation and /or a methodological approach replicable in other ambits of the "green and circular challenge" for the wood sector?

Yes, absolutely. The participatory approach proposed in the FA is a model that could be adopted for other H&S issues and, more in general, about environmental sustainability or aspects like vocational education, because it can reinforce:

- Social partnership and sharing of data at EU, national and company level
- A higher acceptance of new rules and behaviour (bottom up)
- the participation (and /or representation) of workers and involvement of workers in learning by doing and improving processes.

A final reflection is done about the importance of Eu projects on these issues: social partners should promote transnational projects on skills and multidisciplinary socio-economic research projects (new materials, ergonomics, technological innovation and organizational changes) to make the Green Deal "come true". Then the results of projects must be more intensively capitalized at national level, and Eu guidelines deriving from projects widely applied and implemented at national/local level.

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3.3. The experience of a level II bargaining agreement addressing the issue of CO_2 emissions

The practice in brief	Level II bargaining agreement of a leading cement industrial group. The agreement provides for a performance bonus to employees, also based on the achievement of the sustainability objective focusing on reducing CO_2 emissions.
Period	November 2019
Scope	Contributing to the implementation of environmental sustainability principles through company policies linking the awarding of the performance bonus to employees to the parameter - among others - of reducing CO_2 emissions.
Geographical coverage	10 Group plants throughout Italy.
Introduction	The industrial sector of cement extraction and production, similar in impact to the chemical sector, is characterized by a massive use of energy and a high level of CO_2 and dust emissions. Processing is considered a highly polluting production specialisation, both for workers and the surrounding environment. The presence of a plant of this type on a territory raises attention and concern on the part of the population (which in part corresponds to the workers) and implies the need to address the "issue" of plant sustainability with respect to the surrounding environment. As far as the sector is concerned, three factors must be considered: • the importance of the human factor in the production process: today cement production is based on a strong technological and automation component, in which, however, the human role in controlling parameters is widespread and fundamental throughout the entire production chain; • the sector has experienced a deep crisis that led to delicate restructuring and consolidation phases with a strong involvement of trade unions and a commitment to Level II bargaining; • workers are sensitive to environmental issues. The company in question shows the three factors described above, and today is as a structured multinational group, with a technological production process, a consolidated management of industrial relations and a strong focus of workers on environmental risks. The company is also participating in a European project addressing the issue of CO_2 storage, through a complex process of solidification.

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Social dialogue/ the parties involved	The following parties were directly involved: the National Coordination of the Group's Unitary workplace union structure assisted by the national secretariats of Feneal -UIL, Filca CISL, Fillea CGIL; the representatives of the industrial group, assisted by the employers' association of the industry. This type of supplementary level II bargaining comes from the collaboration of the social partners at company level. The workers shown they were sensitive to the environmental issue and appreciated the approach of the management to Level II bargaining. Trade unions gave a decisive contribution to the development and definition of the agreement, especially as concerned the identification and improvement of regulatory aspects and economic indicators. Negotiations saw the involvement and participation of workers through meetings between the company management and the National Coordination of the Unitary workplace union structure. This contributed to creating a general awareness. As supplementary agreement, it was signed by the workers and the company. As ex-post evaluation, the implementation of the sustainability provisions included in the agreement can be evaluated ex post, on a yearly basis, starting from the end of the first year of implementation (end of December 2020).
Environmental sustainability	The sustainability aspect is linked to the reduction of direct CO_2 emissions (measured in kg of CO_2 per tonne of cement material produced). Emissions' reduction in the production phase is closely related to a bonus mechanism calculated on the basis of a table matching the improvement values (Kg/t / & = Kg of CO_2 on tons of product) and bonus amount.
Beneficiaries and other stakeholders	Workers are direct beneficiaries of the Level II supplementary agreement, and have two immediate advantages: a) the payment of a performance bonus, linked to the reduction of CO_2 production and emissions; b) the improvement of the working environment and corporate “climate”. The employer is also the beneficiary: a) for the raising of productivity and efficiency standards; b) for the improvement of the working environment and the company “climate”. The commitment to reduce CO_2 emissions obviously brings benefits to the territory and the community.
Impact	The agreement covers more than 1,000 workers in 10 plants throughout the country.
Innovation	The decision to identify a sustainability indicator shows a clear commitment to focus on the noble path of competitiveness and not on cost reduction:

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	this choice brings with it a series of extremely positive consequences, such as the need to make investments focusing on the efficiency of production processes and product quality, the activation of new organizational and training methods suitable to allow compliance with environmental protection and safety at work regulations and the involvement of workers.
Critical factors/ constraints	It is too early to estimate the effects of the agreement, which shall be measured in the coming years. It will take at least three years. Any criticalities and constraints will come from the application of the agreement in daily practice.
Replicability	With reference to the wood sector, it can be assumed that this experience could be replicable. However, it must be taken into account that the environmental issue in the wood sector is still mainly perceived as an individual business choice and not as an issue bearing a general impact also on the surrounding environment. In the wood sector, the control of the company's external stakeholders is less stringent than in the cement sector. The following elements should be considered among the conditions that could favour/prepare replicability in the wood sector: a. supply chain agreements (as in the construction sector), upon suggestion of trade unions, that touch on environmental issues; b. training on environmental issues for workers and employers; c. action by local authorities; d. increasing consumer awareness of environmental issues related to production in this sector. In any case, the will to make this experience replicable is inherent in the choice to adopt a "culture of sustainability" in the company and in society.
Lessons learned	The key message is that innovations of this kind also pass through the sensitivity and foresight of the employer. Considering this experience, a good practice of social dialogue can help because: • it is an example of positive environmental interaction between territory, workers and business; • it combines the issue of sustainability with concrete and easily identifiable objectives; • it addresses the challenge of sustainability in a difficult sector with high energy costs, low margins and a poor reputation for the environment. The short time elapsed since the entry into force of the Agreement makes it difficult, however, to assess its impact (in the short and medium term) and the elements of transferability to the wood sector cannot yet be clearly identified.

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3.4. A joint training pilot path on the sustainability development goals

The action-training path "Towards a sustainable business with the SDGs as a compass!" is a project carried out by WOODWIZE, the bilateral sectoral organisation for wood and furniture sector in Belgium; it represents an example of a joint vision, shared by trade unions and employers' associations. A participative approach is proposed to companies, fostering a pro-active involvement of workers in reaching the sustainability development goals.

Typology	Training project
Period	Planned for September – December 2020 - 8 half days
Aim	In this practice-oriented inspirational training, the SDGs are used as a compass to take companies on an inspiring and instructive on sustainability. To get started and to enable to monitor progress, a useful tool was created by Trendhuis, the SDG-fitplan. Participants are informed and overwhelmed on the inevitability of CSR today and how the SDGs act as a compass and as beacons. And, of course the training displays its fair share of Belgian role model companies in the wood and furniture sector when it comes to sustainability.
Geographical and sector coverage	Flanders Region, BE.
Social partners involved	Trade unions and employers' associations of Belgian Woodworking and Furniture Industry: ACV BIE (Construction, Industry and Energy Trade Union), ABVV-AC and ACLVB (General Confederation), Fedustria (Belgian Confederation of Woodworking, Furniture and Textile Industries), Bouwunie (Construction Confederation) and Belgische Houtconfederatie (Belgian Confederation of forestry contactors and sawmill industries).
Social dialogue	Project was carried out by WOODWIZE, the paritary sectoral organisation for wood and furniture sector in BE. In the provided "inspirational learning guide", the proposed examples are all carried out in consensus with employers and employees.

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Critical factors/ constraints	The industry of wood and furniture is facing important challenges. The raw material “wood” is becoming scarcer, the raw material prices are rising, the profitability and competitiveness are under pressure, it is more and more difficult to attract (young) professionals. Together with wood and furniture companies, WOODWIZE wants to support a sustainable future, with an eye for economic issues and employment, with respect for the people and the environment. However, currently the concept of sustainability is sometimes used inappropriately. Within the wood and furniture industry, sustainability has a special meaning. Not at least due to the use of wood, a naturally sustainable material, that is one of the (basic) pillars of sustainable entrepreneurship. However, sustainability not only stands for a responsible raw materials policy (such as the use of wood from sustainably managed forests), but sustainability needs also to focus on (the training of) employees, compliance with local environmental legislation, responsible energy consumption, and more generally, the business itself. Many companies from the wood and furniture industry want to invest in sustainable entrepreneurship. But they need guidance, knowledge and easy-to-use tools. During this training, companies are supported in developing a structured sustainability process, adapted to their own company needs. The learning content is adapted to the wood and furniture sector, with some inspiring practical testimonials. At the end of the training, the participants go home with an “SDG-fit plan”, tailored to their own company.
Contribution of social partners	In order to develop a company specific SDG-fit plan, it is necessary to set up a “Sustainable entrepreneurship working group”. This working group ensures that the sustainability policy is implemented effectively and efficiently. The working group is composed of employees from various departments and employees’ representatives. The Union representatives play a crucial role in convincing the “non-believers”. It is the task of the union representatives, together with the other members of the working group, to inform all employees on the importance of participating as a company in the realization of the SDG-objectives by 2030. This way, the sustainability policy becomes a recurring item on the agenda of social dialogue within the company.
Beneficiaries	Employees, management, executives, suppliers, customers.
Methodology	The training “Towards a sustainable business with the SDGs as a compass!” is set up around 8 half days, spread over a 2 months period. At the end of the training, each participating company will be able to work with their own SDG-fit plan.

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	This SDG-fit plan will be developed during the training sessions and is adapted to the specific company needs. The participants need to do some homework between two sessions. This homework will be discussed during the next training day, so participants also learn from each other. Three- four cases from the wood and furniture industry will be presented as good practices. Day 1 The inevitability of sustainable business. Day 2 Towards social responsibility. Day 3 The 4 steps of the SDG-fit plan: Step 1: Development (part 1) Day 4 The 4 steps of the SDG-fit plan: Step 1: Development (part 2) Day 5 The 4 steps of the SDG-fit plan: Step 2: Integration Day 6 The 4 steps of the SDG-fit plan: Step 3: Realization Day 7 The 4 steps of the SDG-fit plan: Step 4: Measuring Day 8 Building a sustainable company: Building cells & Leadership
Validation	To validate the results of the training and the SDG-fit plan, a follow-up moment (1/2 day), +/- 1 year after the training are organized. During this follow-up, the participating companies exchange their experiences and learn from each other's successes and obstacles.
Impact	The SDG-fit plan is a structured “growth and follow-up method” for a sustainable business. It is a step-by-step plan, that is easy to understand, that can be easily implemented; adjustments can be made based on measurements. The SDG-fit plan starts by evaluating (by self-assessment) the levels of the 25 defined work domains. This questioning gives the company a clear overview on their sustainability approach. With an impact assessment, the company maps the lasting effects. It concerns both positive and negative impact. With a materials analysis, the companies determine which themes are important to their organization, within the framework of a sustainable society. Two dimensions are considered: on the one hand the impact on society, and on the other hand what is relevant to the company itself. The SDG-fit challenge is the last “measurement” in the SDG-fit plan. With the SDG-fit challenge, “attention”, “effort” and “result” (AER) in the field of the various SDG’s are questioned and visualized. By repeating this regularly, preferably annually, the company can determine the evolution, it will be more aware of sustainable entrepreneurship and can further expand the four steps of the SDG-fit plan.

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Innovation	This path is a new way to integrate sustainability within all company processes and with the involvement of all stakeholders within and around the participating companies.
Critical factors	The companies must have a sustainability ambition. Support is needed from managers to give the sustainability process and policy a chance to succeed. There must be support at different levels; budget and time must be allocated. Moreover, the financial value of sustainable entrepreneurship is difficult to be measured.
Conclusions	The SDG fit plan is a structured "growth and follow-up method" in which both the employees and the various stakeholders of a company must be involved. It can inspire both small and large companies, in their own company-specific development of sustainable entrepreneurship. It is a step-by-step plan that can be used both for companies, that have yet to start with sustainable entrepreneurship and for companies that have already started with this kind of approach.
Owner(s) of the practice	WOODWIZE, together with TRENDHUIS

Contact persons	Mr. Jeroen Doom, director of WOODWIZE (jeroen@woodwize.be), Ms. Jenny Van Damme, consultant for WOODWIZE (jenny@woodwize.be), Ms. Nathalie Bekx, CEO of TRENDHUIS (nathalie.bekx@trendhuis.be)

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3.5. CNUF® - Ecologic Certified Coffin

AIMMP created and developed CNUF®, an ambitious certification scheme aimed at guarantying the production of ecologic coffins, supported on a set of criteria and third party conformity assessment.

CNUF® certified coffins are made with easily degradable wood species, upholsters composed of natural vegetal fibres, varnishes and glues with low volatile organic compounds and formaldehyde emissions, as well as limited use of metals.

This is an example of how a need presented by the market was met by the industry, through its sectorial association, promoting an improvement on employees' work conditions, health and safety, as well as raising awareness about the environmental impact of using non-ecological coffins for buriers and cremations.

Typology	Voluntary certification scheme for the fabrication of ecological coffins
Period	The certification scheme was launched in 2014, as a result of a joint effort from AIMMP, coffin manufactures and funeral services agencies. CNUF® is a registered trademark at EUIPO.
Aim	CNUF® voluntary certification scheme was developed with two main objectives: • as an answer to the demands of the coffin industry workers asking for the use of less harmful and environmentally friendly raw materials, especially coating products and glues. • Answering to the market need expressed by funeral services agencies of a third-party certified ecological coffin, assuring the compliance with national regulations concerning the protection of soils and air pollution. The implementation of the certification scheme requirements in the coffin industry led to the need of improving the control of several aspects related to the production process, hence leading to enhanced workers' involvement, training and acquisition of new skills.
Geographical and sector coverage	Wood transformation industry. The Relevant NACE sector is 32 – Other transformation industries, mainly code 32995 – Fabrication of coffins.
Social partners involved	Portuguese Association of Wood Industries and Furniture (AIMMP); Coffins Manufactures National Council (CNUF); Union of industry workers (SINDEQ)

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Social dialogue	The project that support the development of the certification scheme works in several dimensions to promote cooperation between social partners aimed at beneficial work conditions at all levels whilst cooperating for an enhanced environmentally responsible production of coffins. In practice, the efforts made to develop and promote the certification system led to the improvement of the level of protection of workers in this particular industry. It is the result of a broader project aimed at identifying the challenges faced and solutions offered by the Woodworking industries and developing recommendations to the companies and workers involved.
Sustainability issues	Burials and cremations are potential sources of pollution on soils and atmospheric air, respectively. For this reason, the use, in coffin production, of easily degradable wood species, coating products with low emission of VOC and formaldehyde, as well as biodegradable textile fibres is of paramount importance. Coating products and glues with high percentage of VOC present a major hazard for workers comprising a potential to cause adverse health effects. In cremation facilities, during the combustion process, these highly volatile chemicals may cause malfunctions and even unexpected explosions. Formaldehyde, through lixiviation, increases the potential production of nitrates on soils, leading to groundwater contamination.
On line sources	https://cnuf.pt/

Appendix "Good Wood" Glossary

This glossary has been shared among the "Good Wood" partners in order to adopt a common knowledge base and shared definition on the main key-words of the project.

(1) SOCIAL DIALOGUE/EUROPEAN SOCIAL DIALOGUE

According to the European Commission, social dialogue refers to 'discussions, consultations, negotiations and joint actions involving organisations representing the social partners – employers and workers. Social dialogue is the dominant feature of collective industrial relations in Europe, as the Commission communication The European social dialogue, a force for innovation and change (COM (2002) 341) of 26 June 2002 acknowledges.

Source: European Foundation for the Improvement of Living and Working Conditions - February 2019
Social dialogue is a fundamental component of the European social model.

It enables the social partners (representatives of management and labour) to contribute actively, including through agreements, to designing European social and employment policy.

The LEGAL BASIS is within Articles 151-156 of the Treaty on the Functioning of the European Union (TFEU). The Objectives are defined under Article 151 TFEU, the promotion of dialogue between management and labour is recognised as a common objective of the EU and the Member States. The aim of social dialogue is to improve European governance through the involvement of the social partners in decision-making and implementation.

Source: http://www.europarl.europa.eu/ftu/pdf/en/FTU_2.3.7.pdf

(2) BIOECONOMY

The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food, and pulp and paper production, as well as parts of the chemical, biotechnological and energy industries. Its sectors have a strong innovation potential because of their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge (EC, 2012).

Source: https://www.eea.europa.eu/publications/circular-economy-and-bioeconomy

(3) CIRCULAR ECONOMY

An economy that is restorative and regenerative by design. It aims to maintain the utility of products, components and materials, and retain their value (Ellen MacArthur Foundation, 2013).
The 5 fundamental criteria of Circular Economy:

1. Eco design: Designing products by using them at the end of their life, therefore with features that will allow their disassembly or renovation
2. Modularity and versatility: Giving priority to modularity, versatility and adaptability of the product

3. Renewable energies: Reliance on energy produced by renewable sources and the rapid abandonment of the energy model based on the fossil sources
4. Ecosystem approach: Thinking in design, taking care of the inter-system and considering the cause-effect relationships between the different components
5. Recovery of materials: Promote the replacement of virgin raw materials with secondary raw materials coming from recovery chains that preserve their qualities.

Sources:
https://www.eea.europa.eu/publications/circular-economy-and-bioeconomy
http://www.economiacircolare.com/
https://www.ellenmacarthurfoundation.org/circular-economy/concept

(4) CIRCULAR BIOECONOMY

It is based on the synergies of the circular economy and on concepts of the bioeconomy. Up to now, these two paradigms have been developed in parallel but now it is needed to connect them in order to let them strengthen each other. The bioeconomy covers all sectors and systems that rely on biological resources (animals, plants, micro-organisms and derived biomass, including organic waste), their functions and principles. As such, it is a central element to the functioning and success of the EU economy. A sustainable and strong bioeconomy can help meet the many environmental and socio-economic challenges facing Europe: climate change, plastic pollution of the oceans, the exodus from rural and coastal communities, to name but three.

Sources:
https://publications.europa.eu/en/publication-detail/-/publication/f57a0695-04d9-11e9-adde-01aa75ed71a1/language-en/format-PDF/source-84695789
https://www.efi.int/publications-bank
https://www.eea.europa.eu/publications/circular-economy-and-bioeconomy

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This publication was produced with the financial support of the European Union. Its contents are the sole responsibility of the Good Wood partners and do not necessarily reflect the views of the European Union.