SAWYER

Skills and safety needs in a circular furniture sector

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State of the art of Circular Economy in the Furniture Sector

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List of Acronyms

BREEAM - The Building Research Establishment's Environmental Assessment Method
CARB - California Air Resources Board
ECHA - European Chemicals Agency
EEE - Electrical and Electronic Equipment
EMAS - The EU Eco-Management and Audit Scheme
EMS - Environmental Management System
EPR - Extended Producer Responsibility
ERP - Energy Related Product
EU - European Union
EUTR - European Union Timber Regulation
FLECT - Forest Law, Enforcement, Governance and Trade
FR - Flame retardant
FSC - Forest Stewardship Council
GPP - Green Public Procurement
ISO - International Organization for Standardization
JRC - Join Research Centre
LCA - Life Cycle Assessment
LEED - Leadership in Energy and Environmental Design
NGO - Non-governmental organisation
OECD - The Organisation for Economic Co-operation and Development
OEF - Organisation Environmental Footprint
PEF - Product Environmental Footprint
PEFC - Programme for the Endorsement of Forest Certification
POP - Persistent organic pollutant
REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals
RED - Renewable energy Directive
RoHS - Restriction of Hazardous Substances
SVHC - Substances of very high concern
TSCA - Toxic Substances Control Act
VPA - Voluntary Partnership Agreements
WEEE - Waste of Electrical and Electronic Equipment

1. INTRODUCTION

1.1. OBJECTIVE OF THE DOCUMENT

The objective of this document is to analyse the current status of the circular economy within the furniture sector, it mainly focuses on the level of deployment of selected legislative and voluntary instruments, which can act as promoters of the circularity in this sector.

This document is the basis for future discussions on the potential impact of Circular Economy on:

- the work organization (new materials, technologies, tasks, skills…);
- the working conditions (new OHS…)
- as well as new business models (new ways of production/sales, market opportunities…)

Having this knowledge is important to ensure mid & long-term competitiveness of the EU furniture industry, which will affect workers' jobs and their safety.

1.2. SELECTED INSTRUMENTS

The following legislative and voluntary instruments have been selected due to their potential impact on promoting the transition of the furniture sector toward the circular economy.

Nowadays, some of them have a reduced impact on the sector, but it is foreseen that their influence will be greater in a near future.

Legislative Instruments:

- Circular Economy Package of the EC
- Waste Electrical and Electronic Equipment Directive (WEEE)
- Restriction of hazardous substances in Electrical and Electronic Equipment (ROHS)
- Energy related Products Directive (ErP or eco-design directive)
- Extended Producers Responsibility (EPR schemes)
- Hazardous substances / REACH Regulation
- Formaldehyde emissions
- EU's rules on "end-of-waste" criteria
- Flame retardants
- Renewable energy Directive (RED II)
- Illegal logging and illegal timber trade

Voluntary Instruments:

- Green Public Procurement
- Environmental management in organizations
- Eco design methodology (
- Eco labels (Type I, II, and III)
- Chain of custody certification
- Green building certification

Other Policies and Strategies

- Cascading use of wood

- EU industry policy for Forestry
- Forest-based Industries Blueprint
- Bioeconomy

The following sections analyse these instruments individually, highlighting their present situation at European level.

The specific situation of these instruments at different EU countries (i.e. Bulgaria, France, Italy, Romania, Spain, Sweden and The Netherlands) will be analysed in a separated document, with the involvement of relevant organisations from these countries.

The previously mentioned instruments are mainly associated to environmental aspects. However, we have to mention that there are other types of instruments, out of the scope of this project, which can also promote the transition toward a more Circular Economy in the Furniture sector, such as:

- Financial instruments (e.g. funding programmes, direct and indirect taxes reductions, etc.).
- Health and Safety instruments (e.g. regulations of working conditions, consumers' safety, etc.).
- Trade Instruments (e.g. CE marking, market surveillance, etc.).
- Social instruments (e.g. collective labour agreements, etc.).

2. EXECUTIVE SUMMARY

The Table 1 summarises the results of the analysis of the previously mentioned Legislative and Voluntary Instruments and other Policies and Strategies, indicating the estimated level of deployment of these instruments, and the Situation/Impact on the furniture sector at European level of these instruments, with scores from 1 to 5 (1 = minimum value and 5 = maximum value).

More details about the different instruments can be found in the following chapters.

Table 1.- Summary of the different Instruments

Instrument	Description	Level of deployment	Situation/Impact on the furniture sector at EU level
Legislative Instruments			
Circular Economy Package of the EC	Circular Economy Action Plan (COM (2015) 614) aims to boost the implementation of Circular Economy in Europe. It includes revision of some regulations (e.g. framework on waste) and other actions to promote circularity (e.g. plastic strategy).	5 All the 54 proposed actions have been completed or they are in the implementation phase {SWD(2019) 90 final}.	3 {SWD(2019) 92 final, includes the furniture products as priority product category for the circular economy.
Waste Electrical and Electronic Equipment Directive (WEEE)	The Directive 2012/19/EU enquires the establishment of collection schemes (free of charge for consumers) in order to increase the WEEEs re-use and/or recycling.	5 The former WEEE Directive entered into force in 2003. In 2017 the Commission adopted the "WEEE package", and in 2018 a final report on WEEE compliance promotion exercise, examining the implementation in each EU country.	2 Furniture products, containing electrical or electronic components could enter in the "open scope" of WEEE. These discussions are based on the change in wording regarding when an item requires electric currents or electromagnetic fields in order to fulfil its basic function to enabling it to work properly.
Restriction of use of hazardous substances in Electrical and Electronic Equipment (ROHS)	Directive 2011/65/EU was amended by the Directive (EU) 2017/2102, reviewing the scope for some group of products and facilitating to encourage a more circular economy in the Union by promoting the secondary market operations for EEE, which involve repair, replacement of spare parts, refurbishment and reuse, and retrofitting.	5 The former ROHS Directive entered into force in 2003. It was reviewed several times to modify the exceptions and their deadlines.	2 It does not apply directly to furniture products, but should be taken into account when electric & electronic equipment are integrated on them. The "open scope" mentioned above for WEEE may be considered also for ROHS, based on the strict interpretation of the definition of Electrical and Electronic Equipment and the generic category 11 indicated in Annex I of ROHS Directive (11. Other EEE not covered by any of the categories above).
Energy related Products Directive (ErP or eco design)	The Directive 2009/125/EC is the framework to define Ecodesign requirements for products that use energy or which are energy related (i.e. they do not consume energy directly, but can provoke the use of	4 EC publishes Working Plans to identify priority family products and future strategies. The latest working plan covers the period 2016-2019 and gets more	2 Nowadays there is not a regulation, under the Ecodesign Directive, that directly affects the furniture products but it is possible that some components used on

Instrument	Description	Level of deployment	Situation/Impact on the furniture sector at EU level
	additional energy, such as windows).	attention to resource efficiency, analysing the possible application of additional "product-specific" requirements on matters such as durability, etc.	them would be affected (for example LEDs, displays, etc.). The Circular Economy Action Plan also includes a commitment to examine new options under the Ecodesign Directive, beyond energy-related products (e.g. furniture and textile). The Nordic Council of Ministers analysed possible eco-design requirements for non-energy related products, using textiles and furniture sector as example.
Extended Producers Responsibility (EPR)	The Extended Producer Responsibility (EPR) is "an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle".	4 Existing directives at EU level for some specific products (WEEE, batteries, end-of-life vehicles, packaging, etc.). At national level, EPR schemes for other products.	3 Only France has implemented two ERP schemes for domestic and commercial furniture. The Commission is analysing to increase the ERP schemes to other products (including furniture).
Hazardous substances / REACH Regulation	REACH Regulation (EC 1907/2006) has the objective of improving human health and environment protection by identifying the hazardous properties of chemical substances used in EU. Both manufacturers and importers have the responsibility to collect information on the specific and critical properties of chemical substances they use.	3 REACH is fully operational but it is lagging behind initial expectations. Some identified problems are among others the lack of compliant information in the registration dossiers or the need of simplification of the authorisation process.	4 Some substances used in the furniture sector could be included as restricted or candidates for authorisation. Furniture manufacturers could be considered as "downstream users" and they should comply with the associated obligations.
Formaldehyde emissions	The formaldehyde produced and imported at European level is used mainly for manufacturing resins used for manufacturing of wood-based panels. The exposure to formaldehyde emissions is an important issue for consumers (emissions from articles) and for workers (occupational exposure).	2 At European level, there is not a common legislative requirement, but there is a voluntary industry agreement of the members of the European Panel Federation (EPF), which produce only class E1 wood-based panels. Some EU Member States have adopted national legislations.	4 This issue could be important for wood-based panels manufacturers and producers that use them, especially for entering into the market of these EU countries that have specific legislation and into US (TSCA Title VI compliant).
EU's rules on end of life waste criteria	The Waste Framework Directive 2008/98/EC indicates that some specific waste shall stop to be considered normal waste if it has undergone through a recovery process	3 At European level, the criteria have been defined for 8 types of waste, but there are specific regulations for iron, steel, copper	2 Regarding the furniture sector, wood waste stream (partially from furniture) has been analysed as stream that may be in line with

Instrument	Description	Level of deployment	Situation/Impact on the furniture sector at EU level
	(including recycling) and if it complies with specific criteria developed in line with certain legal conditions. The objective is to remove the administrative burdens of waste legislation for safe and high-quality waste materials, in order to facilitate their recycling.	and aluminium scrap and for glass cullet.	the principles, but not specific criteria was defined due to doubts about the current situation of wood recycling in EU.
Flame retardants	Some furniture products use flame retardants to fulfil the variety of flammability standards for furniture. Some of these standards require compliance with open flame tests, forcing the use of flame retardants. Some type of substances used for flame retardants are regulated under the Regulation (EU) 2019/1021, which recast the Regulation (EC) 850/2004 on persistent organic pollutants (POPs).	3 The use of flame retardants are not directly regulated at European level. Indirectly, it is regulated if the used substances are considered as hazardous (e.g. via REACH or POPs Regulation). The mentioned regulations are well deployed, and new substances are under study.	4 Regarding the furniture sector, some countries regulate the flammability requirements for some type of furniture (e.g. UK and Ireland). The Alliance for Flame Retardant Free Furniture in Europe, which involves different type of organisations, aims to stop the use of flame retardants in furniture products, supporting safer alternatives.
Renewable energy Directive (RED II)	In December 2018, the revised renewable energy directive 2018/2001/EU entered into force, as part of the Clean energy for all Europeans package. It establishes a new binding renewable energy target for the EU for 2030 of at least 32%, with a clause for a possible upwards revision by 2023. The Renewable Energy Directive sets out biofuels sustainability criteria for all biofuels produced or consumed in the EU.	4 The Directive is deployed and more ambitious targets for renewable energy are under consideration. Regarding biofuels sustainability, companies can show they comply with the sustainability criteria through national systems or so-called voluntary schemes recognised by the European Commission.	2 Regarding the furniture sector, the biofuels industry is analysing the potential use of raw materials for second-generation biofuels in agricultural residues, forestry-based biomass and different waste streams, including wood stream from municipal waste.
Illegal logging and illegal timber trade	The Regulation (EU) No 995/2010 defines the obligations of operators selling or distributing timber and timber products. It is known as the EU Timber Regulation or EUTR, as part of the EU Forest, Law, Enforcement, Governance and Trade (FLEGT) Action Plan. Another scheme is the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).	5 These regulations and Action Plans are deployed at EU and international level. New action plans to protect forest are published, for example COM(2019) 352 final about “Stepping up EU Action to Protect and Restore the World’s Forests”, proposing the creation of an EU Observatory on Deforestation and Forest Degradation.	5 These regulation and schemes apply to timber harvested in both the EU and internationally, obligating businesses to assess and mitigate any risks that the timber in their products has come from an illegal source.

Instrument	Description	Level of deployment	Situation/Impact on the furniture sector at EU level
Voluntary Instruments			
Green Public Procurement (GPP)	Green public procurement incorporates environmental criteria in the specifications of a public tender, involving the integration of the environmental components into public procurement decisions. These environmental criteria could cover different aspects of the products during their life cycle. GPP can foster the creation of a critical demand mass of more sustainable goods and services, which otherwise would not be easy to get in the market.	3 The level of real implementation is different in each EU country. The European Commission and several EU countries have prepared different guidelines for GPP processes, in the form of national GPP criteria. The main challenges are to ensure compatible GPP requirements between different EU countries and to foster more public sector bodies to adopt these criteria.	3 An updated version of the EU GPP criteria for furniture has been published in August 2017, in parallel with the revision of the EU Ecolabel criteria for this type of products. It covers criteria at raw material and product level. Several examples can be found at EU level about the application of GPP criteria for furniture, for example the procurement of refurbished school furniture in Aalborg – Denmark.
Environmental management in organizations	An environmental management system (EMS) can help organizations in the identification, management, monitoring and control of their environmental aspects in a "holistic" manner. At European level there are two main certified Environmental Management Systems, which are EMAS and the ISO-14001:2015.	4 Different revisions of the ISO and EMAS schemes have been published. They are consolidated schemes, but partially implemented in the business sector. At EU level, 3,728 organizations have EMAS certification (April 2019) and 111,133 ISO-14001 certifications (2017).	3 EMAS and ISO-14001 can be applied to the furniture sector, however there are only 35 EMAS registered organisations (2019) related to the furniture sector (NACE code 31), most of them in Germany (24 organisations). Regarding ISO-14001, in 2017 there were 541 organisations certified classified as "manufacture of wood and wood products".
Eco-design methodology	Eco-design is defined as "the integration of environmental aspects into product design and development with the aim of reducing adverse environmental impacts throughout a product's entire life cycle" The UNE-EN ISO 14006:2011 provides guidelines to assist organizations in establishing, documenting, implementing, maintaining and continually improving their management of eco-design as part of an EMS. Thera are other standards related to eco-design, such as UNE-ISO/TR 14062:2007 or IEC 62430:2019	3 The last revision of the ISO 14006 was in 2011. The standard indicates that it is not intended for certification purposes, which make difficult to know the real level of implementation in the market. In any case, it is assumed that this implementation is much lower than ISO-14001.	2 ISO-14001 can be applied to the furniture sector, but it was not possible to find information about its impact in the furniture sector at EU level. In any case, its affectation is lower than the ISO-14001.

Instrument	Description	Level of deployment	Situation/Impact on the furniture sector at EU level
Eco labels (Type I, II, and III)	The ecolabels try to give information to the customers, about the environmental characteristics of a product. There is a huge amount of different ecolabels, but all of them could be included in three main types of ecolabels (i.e. I, II and III) and they are regulated under the ISO 14020.	4 The different ecolabel systems are well developed, and are broadly used in some type of products (e.g. consumer products). However, some additional work is needed to better inform the consumer about the real meaning of these ecolabels to avoid misunderstanding.	3 There are different types of ecolabels that have fixed criteria for furniture products (e.g. EU ecolabel, Blue Angel, Nordic Swan, NF Environment, or EPD System). However, the acceptance in the sector at EU level is low (e.g. only 2 EU ecolabel licences regarding furniture sector in March 2019).
Chain of custody certification (FSC / PEFC)	Timber supply Chain of Custody certification provides evidence that the certified product originates from certified, well managed forests. It verifies and ensures that these products are not mixed with other products from no-certified forests at any point along the supply chain, except under strict controls when percentage (%) labelling is being used. There are currently two independently accredited chains of custody programmes operating in the Timber Industry: The FSC (Forest Stewardship Council) and the PEFC (Programme for the Endorsement of Forest Certification) schemes.	5 These two schemes are well developed and demand for chain of custody certification has grown dramatically in the last three years, to the extent that, for many companies, the ability to prove that a timber product has been derived from a well-managed source is now a key factor in the specification of timber and paper products.	5 In August 2019, there were 19,434 Global FSC Chain of Custody certificates in Europe. Regarding PEFC, in 2018, there were 9,310 PEFC Chain of custody certificates. Therefore, the affectation to furniture sector, at EU level, is high.
Green building certification (BREEAM / LEED)	There are two main green building certification schemes: The Building Research Establishment's Environmental Assessment Method (BREEAM), which was the first green building rating system developed in the UK, and the Leadership in Energy and Environmental Design (LEED) developed lately in the U.S. by the Green Building Council (USGBC).	4 These two schemes are well deployed at EU level. For example, 19,542 BREEAM assessments are certified in EU Countries (most of them in UK) and 3,766 LEED certified projects. There is an increasing demand of this type of certification, but it is still a small part of all buildings sector.	3 This type of certification does not affect directly the furniture sector, but it can have a certain effect because the use of “green” furniture can give additional credits to obtain the building certification. Some wood-based products manufacturers use this as a marketing strength.
Other Instruments and Policies			
Cascading use of wood	Cascading use of biomass resources, such as wood and agricultural products, means an efficient use of these resources from the point of view of natural resources, materials and land consumption. It gives priority to	2 The European Commission has published two relevant publications on this issue, including Guidance on cascading use of biomass.	3 An adequate eco-design and collection and recovery operations could facilitate more cascading use of solid wood by increasing availability of secondary wood materials of

Instrument	Description	Level of deployment	Situation/Impact on the furniture sector at EU level
	higher value uses that allow the reuse and recycling of products and raw materials, promoting energy use only when other options are not feasible.	Until the date, there are no other requirements associated to this topic.	suitable quality. Equally important to enhance cascading use in furniture material is the development of loop solutions for wood-based boards that are the most frequently used wood component in furniture.
EU industry policy for Forestry	The EU Commission adopted the EU Forest Strategy in 2013 (COM(2013) 659 final), which aims to help forests and the related sector to tackle current challenges. The Strategy provides a framework to respond to the increasing demands put on forests and to deal with societal and political changes. The EU forest strategy 2014-2020 was developed to provide a coherent framework for both EU forest-related policies and the national forestry policies of the individual EU countries.	4 In 2018 the Commission delivered the report "Progress in the implementation of EU forest strategy" (COM(2018) 811 final) reviewing this strategy. The review highlights that the EU forest strategy is achieving its objective to foster a more sustainable forest management at EU and global level.	3 The EU strategy proposes a new approach, "going out of the forest", dealing with aspects of its value chain, i.e. the methods through which forest resources are utilized to produce goods and services, which strongly affect forest management.
Forest Based Industries Blueprint	In 2013, the European Commission published the Blueprint for the EU forest-based industries (SWD(2013) 343 final). This document accompanied the EU Forest strategy and it highlights the challenges that the forest-based industry has to address to remain competitive.	3 Some actions have been identified to address these challenges for the timeframe 2014-2020. A group of organisations have presented their shared strategic vision and agenda towards 2050 for the Forest-Based Industries.	4 These strategies and action plans affect directly the wood-based furniture products. However, the real effect on the sector could be limited depending on the real implementation of the proposed action plans.
Bioeconomy	The goal of Bioeconomy is a more innovative and low-emissions economy, integrating demands for sustainable agriculture and fisheries, food security, and the sustainable use of renewable biological resources for industrial purposes, while ensuring biodiversity and environmental protection.	3 The European Commission has set a Bioeconomy Strategy and action plan, published in 2012 and revised in 2018. This update designed an action plan including 14 concrete actions to be launched in 2019. Moreover, the Commission works on ensuring a coherent approach to bioeconomy through different programmes and instruments (e.g. Horizon 2020, BBI, etc.).	2 The real effects on the furniture sector nowadays is low, but could be more relevant in the future because the strategy covers all economic and industries sectors that use biological resources and processes to produce bio-based products (i.e. wood).

3. LEGISLATIVE INSTRUMENTS

3.1. CIRCULAR ECONOMY PACKAGE OF THE EC

In December 2015, the Commission adopted a Circular Economy Action Plan (COM (2015) 614) to boost the implementation of Circular Economy in Europe. This Action Plan includes the revision of some regulations and other actions to promote circularity.

The action plan promoted a systemic approach across entire value chains, mainstreaming circular principles into plastic production and consumption, water management, food systems and the management of specific waste streams.

The action plan includes a balanced mix of voluntary initiatives and regulatory actions along production, consumption, waste management and secondary raw materials. It also identifies five priority sectors: plastics, food waste, biomass and bio-based products, critical raw materials and construction and demolition.

In addition, the circular economy has strong synergies with the EU's objectives on climate change and energy savings and with the Commission's package on 'Clean Energy for all Europeans'.

The circular economy is also instrumental to support the EU's commitments on sustainability, mainly in SDGs 2 (promoting water reuse and organic fertilisers, facilitating food donation), 3 (addressing microplastics), 8 and 9 (boosting innovation, jobs and added value), 12 (supporting waste prevention and responsible management of waste and chemicals, addressing food waste and supporting Green Public Procurement), 13 (potential of material efficiency to reduce CO_2 emissions) and 14 (decisive actions to fight marine litter).

Regarding the furniture sector, the Commission Staff Working document titled Sustainable Products in a Circular Economy - Towards an EU Product Policy Framework contributing to the Circular Economy - {SWD(2019) 92 final}, includes the furniture products as a priority product category for the circular economy, among others such as packaging, electrical and electronic equipment, food, transport and mobility, textiles and building and construction products.

It concludes that there appears to be large remaining potential in the furniture sector, specifically with material substitution, increased recycling and/or increased reuse or preparing for reuse. Enhanced uptake of EU Ecolabel and GPP criteria could realise some of this potential. Requirements on circular design of furniture and/or EPR measures could further achieve results.

3.1.1. Situation of the Circular Economy Action Plan

The actions proposed in the Circular Economy Action Plan are presented in the Annex 1. According to the report and accompanying document published by the Commission in March 2019[1], nowadays all of the actions have been completed or are being implemented, even if

[1] REPORT from the COMMISSION to the EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS on the implementation of the Circular Economy Action Plan {SWD(2019) 90 final}.- 4.3.2019 and the accompanying document of this report, analysing the status of the 54 actions in detail.

work on some of them will continue beyond 2019. The Annex 1 also presents what has been delivered for each action until March 2019.

The relevance of the actions for the Wood-based Furniture Sector is classified according the following colour codes:

⇧ Relevant

⇗ Possibly relevant in the future

⇔ Not relevant

You can find more information about the status of the Circular Economy Action plan in the European Commission website on this field:

http://ec.europa.eu/environment/circular-economy/index_en.htm

The update of the waste **legislative framework** is worth a special note. It came into force in July 2018 and includes the following targets for waste management:

- recycling 65% of municipal waste by 2035;
- recycling 70% of packaging waste by 2030;
- recycling targets for specific packaging materials:
- Paper and cardboard: 85 % Ferrous metals: 80 %
- Aluminium: 60 % Glass: 75 %
- Plastic: 55 % Wood: 30 %
- a maximum of 10% landfill of municipal waste by 2035;
- separate collection obligations for hazardous household waste (by end 2022), bio-waste (by end 2023), and textiles (by end 2025);
- minimum requirements for extended producer responsibility schemes;
- reinforcement of prevention objectives, in particular, requiring Member States to take specific measures to tackle food waste and marine litter.

To have a better view of the ambition of these targets, we can highlight that according to Eurostat, EU28 generated in 2017 a total of 248,653 thousands of tonnes of **Municipal waste**, with around 57,624 thousands of tonnes (23.2%) going to landfill.

As another reference, the Table 2 shows the landfill rate of waste, in different EU countries, excluding major mineral wastes (Source: Eurostat).

Time frequency:	Annual
Waste management operations:	Disposal - landfill (D1, D5, D12)
Unit of measure:	Percentage

Table 2.- Landfill rate of waste, excluding major mineral wastes (Eurostat)

YEAR	2012	2014	2016	
European Union - 28 countries	28	26	24	s
Belgium	3	3	4	

YEAR	2012	2014	2016
Bulgaria	85	82	70
Czechia	24	22	22
Denmark	5	1	3
Germany	10 s	11 s	11 s
Estonia	71	77	83
Ireland	41	24	31 s
Greece	:	:	:
Spain	46	47	45
France	25	23	21
Croatia	63	51	45
Italy	25 s	21 s	19 s
Cyprus	63	65	67
Latvia	:	:	:
Lithuania	45	38	19
Luxembourg	4	6	17
Hungary	55	46	46
Malta	69	71	56
Netherlands	3	2	3
Austria	9	12	9
Poland	29	26	29
Portugal	37	31	33
Romania	60	59	54
Slovenia	13	10	5
Slovakia	53	52	47
Finland	11	17	12
Sweden	9	9	8
United Kingdom	33	29	24
Iceland	:	:	:
Norway	:	:	:
Switzerland	:	:	:

[:] not available

[s] Eurostat estimate

Another relevant Directive related to the Circular Economy Action Plan and published in 2019 is the Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment. This Directive promotes circular approaches that give priority to sustainable and non-toxic re-usable products and re-use systems rather than to single-use products, aiming first and foremost to reduce the quantity of waste generated.

The single-use products covered for this directive are, among others:

- Cups for beverages, including their covers and lids;
- Food containers;
- Cotton bud sticks;
- Cutlery (forks, knives, spoons, chopsticks);
- Plates;
- Straws;
- Beverage stirrers;
- Sticks to be attached to and to support balloons;
- Food containers made of expanded polystyrene;
- Beverage containers made of expanded polystyrene, including their caps and lids;
- Cups for beverages made of expanded polystyrene, including their covers and lids.

Depending on the type of products, the Directive fixes restrictions on placing them on the market (by 2021), and enhance product requirements, marking requirements, extended Producer responsibility schemes and separate collection.

3.1.2. Situation of Circular Economy in different EU Countries

According to the "Environmental Implementation Review 2019" of the European Commission (COM(2019) 149 final), there have been some improvements in meeting EU requirements on waste management, but this situation varies considerably among Members States, with large divergences of performance within EU.

In September 2018, 14 Member States have been identified as at risk of missing the 2020 target of 50% municipal waste preparing for re-use/recycling. These are: Bulgaria, Croatia, Cyprus, Estonia, Finland, Greece, Hungary, Latvia, Malta, Poland, Portugal, Romania, Slovakia and Spain[2].

Only five Member States have already reached this target of 50% (i.e. Austria, Belgium, Germany, the Netherlands and Slovenia), in April 2019.

This Communication from the European Commission also indicates that:

- Several Member States should better implement circular economy principles in different areas, for instance concerning water and energy savings, waste prevention, the recycling of materials, the promotion of reuse and repair, and the uptake of secondary raw materials. These Member States are: Austria, Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Germany, Greece, Hungary, Ireland, Latvia, Malta, Poland, Portugal, Romania, Slovakia and Spain.

[2] COM(2018) 656 final

- Some Member States should **further incentivise resource efficiency measures**; improve their **eco-innovation performance**; **increase awareness** and foster the uptake of voluntary instruments such as the EU Ecolabel and Eco-Management and Audit Schemes; increase recycling and circular measures in the SME sector; and/or facilitate green investments and ease the access to funding. These Member States are: Austria, Cyprus, Greece, Hungary, Italy, Malta, the Netherlands, Romania and Slovakia.
- **Waste prevention** remains an important challenge in all Member States, including those with high recycling rates. This is especially important in six Member States (i.e. Austria, Cyprus, Denmark, Germany, Luxembourg, Malta), which produce at least twice as much municipal waste per inhabitant that the Member State with the lowest waste generation.
- The average **generation of municipal waste** in the EU has increased since 2014. Only nine Member States reduced their generation per capita between 2014 and 2016 (i.e. Belgium, Bulgaria, Denmark, France, Germany, Luxembourg, Hungary, the Netherlands and Spain)
- Many Member States need to increase the **effectiveness of separate waste collection** (i.e. Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Greece, Finland, France, Hungary, Ireland, Italy, Lithuania, Latvia, Malta, Poland, Portugal, Romania, Slovenia, Slovakia, Spain and the United Kingdom). Nearly all Member States are encouraged to implement new measures aiming at shifting reusable and recyclable waste away from incineration and landfilling, and to improve and extend their separate collection systems.

As examples of successful practices this Communication mentions: Slovenia (illustrating that circular economy policies and improved waste management can be done in short time-frames); Denmark (providing a good example of open cooperation along value chains and innovation to promote the circular economy) and France (that adopted an ambitious roadmap for circular economy in 2018, with actions aiming to reduce resource use by 30 % by 2030, and introducing an ambitious target of 100 % recycling for plastics by 2025, with an estimation of creating 300.000 new green jobs).

3.1.3. Evolution of Circular Economy Indicators

In 2018, the Commission presented the EU Monitoring Framework for the Circular Economy which included 10 key indicators covering each phase of the lifecycle of products as well as competitiveness aspects. All these indicators are regularly updated and they are available on a dedicated website (https://ec.europa.eu/eurostat/web/circular-economy/). These indicators are classified in four categories:

Production and consumption, comprising 4 indicators:

- Self-sufficiency of raw materials for production in the EU;
- Green Public Procurement (as an indicator for financing aspects);
- Waste generation (as an indicator for consumption aspects);
- Food waste.

Waste management, comprising 2 indicators:

- Recycling rates (the share of waste which is recycled);
- Specific waste streams (packaging waste, biowaste, e-waste, etc.).

Secondary raw materials, comprising 2 indicators:

- Contribution of recycled materials to raw materials demand;
- Trade of recyclable raw materials between the EU Member States and with the rest of the world.

Competitiveness and innovation, comprising 2 indicators:

- Private investments, jobs and gross value added;
- Patents related to recycling and secondary raw materials as a proxy for innovation.

It is possible to analyse the evolution of these indicators at European and at Member State level. Table 3 presents the evolution of the indicator of the number of people employed in Circular economy, in the different EU countries.

Time frequency:	Annual
Economical indicator for structural business statistics:	Persons employed number

Table 3.- Persons employed in Circular economy sector (Eurostat)

YEAR	2012	2013	2014	2015	2016
European Union - 28 countries	3.788.100	3.812.200	3.874.966	3.903.390 s	4.026.954 s
Belgium	54.465	51.303	51.183	53.338	51.999
Bulgaria	62.956	62.394	60.097	59.173	60.952
Czechia	:	:	:	:	:
Denmark	36.486	35.586	38.287	39.040	39.109
Germany	597.435	584.566	626.459	616.734	641.345
Estonia	:	:	:	:	12.549
Ireland	:	:	:	:	:
Greece	:	53.340	56.585	57.973	67.528
Spain	319.452	339.142	348.456	369.797	384.753
France	448.953	450.052	485.871	422.565	419.989
Croatia	33.356	33.029	35.700	35.241	35.094
Italy	520.277	507.496	506.000	502.598	510.145
Cyprus	6.140	:	:	7.064	7.671
Latvia	23.079	24.098	24.872	25.405	25.614
Lithuania	33.212	35.843	36.711	36.490	36.879
Luxembourg	:	:	:	:	:
Hungary	74.778	71.825	73.497	78.494	85.943

YEAR	2012	2013	2014	2015	2016
Malta	:	:	:	:	:
Netherlands	108.302	103.104	100.995	103.420	105.763
Austria	62.075	64.278	64.335	64.494	64.629
Poland	327.187	339.962	334.837	353.196	355.643
Portugal	80.649	79.207	80.686	82.832	84.756
Romania	134.209	135.906	131.293	131.461	132.908
Slovenia	20.330	20.115	:	20.488	20.042
Slovakia	40.386	39.789	38.773	40.362	40.890
Finland	:	:	43.911	43.795	41.794
Sweden	73.484	72.877	73.889	75.746	76.485
United Kingdom	462.078	484.311	452.815	497.828	:
Iceland	:	:	:	3.733	3.883
Liechtenstein	:	:	:	:	:
Norway	47.416	48.740	50.412	51.910	52.282
Switzerland	:	:	:	:	:
Montenegro	:	:	:	:	:
North Macedonia	:	:	:	:	9.088
Albania	:	:	:	:	:
Serbia	:	:	:	:	:
Turkey	:	:	:	:	:
Bosnia and Herzegovina	9.801	:	14.491	13.909	14.062

[:] not available

[s] Eurostat estimate

3.2. WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE DIRECTIVE)

The amount of waste of electrical and electronic equipment (WEEE) is increasing much faster than others types of waste in Europe. In 2005 they represented in total around 9 millions of tonnes, and it is expected that by 2020 they become 12 million tonnes.

This type of waste includes among others cell phones, TV-set, computers and fridges.

The materials and components that compose them are a complex combination of different substances, some of them hazardous ones, and others scarce and critical materials. Therefore, it is needed to improve the WEEE collection, treatment and recycling to support circular economy.

The WEEE Directive, entered into force in 2003 (Directive 20002/96/EC) and reviewed in 2012 (Directive 2012/19/EU). It requires the establishment of collection schemes (free of charge for consumers) in order to increase the WEEEs re-use and/or recycling.

Regarding **furniture products**, containing electrical or electronic components, there is an open discussion about the scope described in Article 2 of the WEEE Directive, which determines that from 15th of August 2018, all EEE shall be classified within the categories set out in the Directive Annex III (**open scope**).

Various entities recently published guidelines and position papers presenting their clarifications on the "open scope" approach. In a similar way, member states internally assess how to determine which products should be submitted or not to this legislation.

These discussions are based on the change in wording regarding when an item requires electricity or electromagnetic fields to fulfil its basic function and **working properly**.

Depending on the member states interpretation and their level of strictness, some products such as furniture and clothes, which contain electronic components may become an EEE, and therefore require a selective collection and treatment when they arrive at the end of their life cycle.

This definition is in line with the Guide for the application of the **Machinery Directive** 2006/42/EC Edition 2.2. - October 2019. In this case, the Machinery Directive considers that some type of electrically-operated furniture, such as beds, chairs, tables, storage furniture, including kitchen furniture, etc., remain subject to the Machinery Directive, as they are not considered household electrical appliances. This includes electrically operated furniture which 'entertains', e.g. by responding to a sound or film track, events in a video game, 'simulates' function such as machinery at shows or exhibitions, or provides a non-medical stimuli (e.g. for relaxation), unless the products are specifically intended for use in fairgrounds or amusement parks. However, when provided for medical purposes the Directive 93/42/EEC applies and not the Machinery Directive.

For more information visit the following website:

http://ec.europa.eu/environment/waste/weee/index_en.htm

The Table 4 presents the recycling rate for e-waste in different EU countries (source: Eurostat). As you can see, there are a lot of notes regarding the presented data, reflecting that there is not a clear definition and common way to collect direct data, making difficult the comparison among countries (different criteria, etc.).

Time frequency:	Annual
Waste management operations:	Recycling rate
Unit of measure:	Percentage

Table 4.- Recycling rate for e-waste (Eurostat)

YEAR	2012	2013	2014	2015	2016
European Union - 28 countries	28,8 s	29,6 s	32,2	35,6 ps	41,2 ps
Belgium	32	31,7	28,4	30,9	34
Bulgaria	62,4	60,2	68,3 d	96,5 d	105,2 d

YEAR	2012	2013	2014	2015	2016
Czechia	27,1	28,5	29,3	37,9	46,1
Denmark	46,5	37,6	42,3	43	41,4
Germany	34,8 d	35,6 d	36,9 d	33,9	39
Estonia	35,9	27,8	30,4	33,3	75,3
Ireland	36,1	38,6	43,1	46,1 de	49,5
Greece	18,6 de	22,1 de	29 de	32,7 e	34,2 de
Spain	19	26,1	26,2	35,6	37,4
France	22,6	23,6	26,3	32,2	37,1
Croatia	:	:	35,7	58,3	89,2
Italy	27,7 d	26,3 d	27,3	32,1	34,4 ps
Cyprus	12,2 d	12,1	17	27 d	23,1 dps
Latvia	26,5	27,8	26,4	23,1	23,2
Lithuania	41,1	43,8	64,6	45,9	38,9
Luxembourg	27,6	29,3	35,4	42,5	45,6
Hungary	30,8	40	47,7	50,7	53,4
Malta	9,9	11	11,5	8,8 ps	6,2 ps
Netherlands	33,2 s	31,3 s	38,1 s	39,3 d	40,4 e
Austria	38,2	37,6	39,1	40,7	41
Poland	30,4	28,1	27,4 d	33,1 d	38,9 d
Portugal	24,9	32,3	38,2	42,7	45,8 d
Romania	14,5	21	21,3	20,4 ps	19,4 ps
Slovenia	26,9	16,7	27,5	47,7	33,9
Slovakia	42,6	41,7	44,1	40,3	50,3 e
Finland	32,8	36,3	42,4	43,2	42,1
Sweden	62,6	64,9	52,7	51,6	55,4
United Kingdom	22,5 s	22,8 ds	29,6 d	36,6 d	49,8 d
Iceland	25,9	23	34	46,7	41,3
Liechtenstein	:	:	117,8 d	127,1 d	111,9 d
Norway	46,4	46,5	47,5	50,4	49,3
Switzerland	:	:	:	:	:
Montenegro	:	:	:	:	:
North Macedonia	:	:	:	:	:
Albania	:	:	:	:	:

YEAR	2012	2013	2014	2015	2016
Serbia	:	:	:	:	:
Turkey	:	:	:	:	:

[:] not available

[de] definition differs (see metadata), estimated

[ps] provisional, Eurostat estimate

[ds] definition differs (see metadata), Eurostat estimate

[d] definition differs (see metadata)

[e] estimated

[dps] definition differs (see metadata), provisional, Eurostat estimate

[s] Eurostat estimate

Some initiatives are trying to improve the compliance with the WEEE directive, such as the I4R platform, which provides treatment and recycling facilities and preparation for re-use operators with access to WEEE recycling information in line with the requirements of Directive 2012/19/EU. https://i4r-platform.eu/.

On the 26th of April 2018, the final report of the "WEEE compliance promotion exercise" was published (developed by Bipro for the European Commission), which analyse, with a tailored methodology, the level of implementation of the WEEE Directive in EU countries and propose measures to promote WEEE compliance.

For example, according to this report, France, Lithuania, Poland and Sweden show a high progression rate compared to rates targeted in 2019; Bulgaria, Denmark, the Netherlands, Romania and the UK show a medium progression rate, whereas 17 Member States have a low progression compared to the needed one. For Croatia and Greece no data are available.

(https://publications.europa.eu/en/publication-detail/-/publication/09c7215a-49c5-11e8-be1d-01aa75ed71a1/language-en).

3.3. RESTRICTION OF HAZARDOUS SUBSTANCES IN EEE (ROHS DIRECTIVE)

The Directive restricting the use of certain hazardous substances in electrical and electronic equipment, which entered into force in 2003 (Directive 2002/95/EC), and it has been reviewed in 2011 (Directive 2011/65/EU).

It was amended by the Directive (EU) 2017/2102, reviewing the scope for some group of products and facilitating to promote a circular economy in the Union by promoting the secondary market operations for EEE, which involve repair, replacement of spare parts, refurbishment and reuse, and retrofitting.

This legislation requires using safer alternatives for some hazardous materials and substances, such as flame retardants polybrominated diphenyl ethers (PBDE) and polybrominated biphenyls (PBB), heavy metals such as lead, mercury, cadmium, and hexavalent chromium. From July 2019, the use of four phthalates will also be restricted.

By July 2021, the Commission shall evaluate the Directive and report on its results to the European Parliament and the Council. The evaluation will take place against the background

of other relevant Commission initiatives related to circular economy, including the one concerning the interface among chemical, product and waste legislations. It does not apply directly to furniture products, but it should be taken into account when these products integrate electric/electronic equipment, such as motors, displays, LEDs, etc.

The "open scope" mentioned above for WEEE may be considered also for ROHS, based on the strict interpretation of the definition of Electrical and Electronic Equipment and the generic category 11 indicated in Annex I of ROHS Directive (11. Other EEE not covered by any of the categories above).

3.4.ENERGY RELATED PRODUCTS DIRECTIVE (ECODESIGN DIRECTIVE)

This directive published in 2009 (2009/125/EC) is the framework to define Ecodesign requirements for products that use energy or which are energy related (i.e. they do not consume energy directly, but can provoke the use of additional energy, such as windows).

These eco-design requirements are published in Regulations, which are specific for each product family.

Companies have to confirm that the products put on the EU market comply with these regulations (Declaration of Conformity) to be allowed to include the "CE" label on them.

The requirements are usually associated to energy efficiency and information to be provided about the product, but they could include any aspect related to the product's lifecycle.

In parallel, the European Commission promote the use of energy labelling for energy-related products by the regulation (EU) 2017/1369. This regulation indicates which products have to include the energy label and the type of information to be displayed on it.

The following table presents the product groups covered by the implemented regulations:

Table 5.- Product groups covered by implemented regulations in the Ecodesign Directive

Air conditioners and comfort fans	Air heating and cooling products	Circulators
Computers	Domestic cooking appliances	Electric motors
External power supplies	Household dishwashers	Household tumble driers
Household washing machines	Industrial fans	Lighting products in the domestic and tertiary sectors
Local space heaters	Heaters and water heaters	Power transformers
Professional refrigerated storage cabinets	Refrigerators and freezers	Simple set-top boxes
Solid fuel boilers	Standby and off mode electric power consumption of household and office equipment and network standby	Televisions
Vacuum cleaners	Ventilation units	Water pumps

The **Ecodesign Directive process** is summarised hereafter:

1. **Work programme**. The EU Commission indicates which families of products are the priority and define future steps (regulations revisions, etc.).
2. **Preparatory Studies**. The European Commission launches a preparatory study, for the selected families of products, involving experts and stakeholders (industry, NGOs), generally lasting 1-2 years.
3. **Working Document.** Based on the previous studies outcomes, the Commission publishes a Working Document with policy options and suggestions.
4. **Consultation Forum.** The EU Commission organizes a discussion about this working document in the Consultation Forum, involving stakeholders including NGOs and industry groups.
5. **Economic and social impact evaluation**. The Commission analyze the impact of the proposed measures.
6. **Draft proposal**. The EU Commission proposes an EU regulation, usually 3 months after the Consultation Forum. Member States officials, composing the Regulatory Committee, vote about this draft proposal. A qualified majority has to be reached for the approval of the final regulation.
7. **Adoption** of EU Commission in cooperation with EU countries.
8. **Validation** by EU Parliament and/or EU Countries, usually taking 2 months.
9. **Publication** in the Official Journal of the European Union (OJ) (official entry into force of regulation).
10. **Requirements entry into force**. Different timetable for each requirement (usually 1 year and 2-3 years steps).
11. **Revision** of the regulation (typically 4-5 years after a regulation enters into force).

The **Third Ecodesign Working Plan** for the period 2016-2019 was adopted by the European Commission on November 2016. This Working Plan included new product groups, such as: building automation and control systems, electric kettles, hand dryers, lifts, solar panels and inverters, refrigerated containers, and high-pressure cleaners.

For more information visit the EU Commission website:

http://ec.europa.eu/growth/industry/sustainability/ecodesign_en

Concerning **Circular Economy**, this new Working Plan (2016-2019) puts more attention to **resource efficiency**, analysing the possible application of additional "product-specific" requirements on matters such as durability (e.g. minimum lifetime of products or critical components), reparability (e.g. availability of spare parts and repair manuals, design for repair), easiness of reuse and recycling (e.g. avoiding incompatible plastics) among others.

CEN & CENELEC are developing standards to cover these issues for energy-related products under the Mandate M/543 from the Commission. These standards are presented in the Table 6.

Table 6.- Standards developed by CEN/CENELEC under the Mandate 543 of the Commission

Ref.	Title	Publication estimation[3]
TR 45550	Definitions related to material efficiency	21/03/2019
TR 45551	Guide on how to use generic material efficiency standards when writing energy related product specific standardization deliverables	21/03/2019
EN 45552	General method for the assessment of the durability of energy related products	01/12/2020
EN 45553	General method for the assessment of the ability to re-manufacture energy related products	09/03/2020
EN 45554	General methods for the assessment of the ability to repair, reuse and upgrade energy related products	09/12/2020
EN 45555	General methods for assessing the recyclability and recoverability of energy related products	27/11/2019 (published)
EN 45556	General method for assessing the proportion of re-used components in energy related product	07/06/2019 (published)
EN 45557	General method for assessing the proportion of recycled material content in energy related products	15/12/2020
EN 45558	General method to declare the use of critical raw materials in energy related products	01/03/2019 (published)
EN 45559	Methods for providing information relating to material efficiency aspects of energy related products	01/03/2019 (published)

The Commission plans to adopt, during 2019, a set of **11 eco-design regulations**, covering the **6** product groups with rescaled **energy labels and new labels** (dishwashers; washing machines and washer driers; refrigerators; lamps; electronic displays and commercial fridges) and an additional 5 products groups for which no label is foreseen (electric motors; external power supplies; power transformers; servers and data storage products and welding equipment).

Nowadays there is not a regulation, under the Ecodesign Directive, that directly affects the **furniture products.** but it is possible that some of their components would be affected (for example LEDs, displays, motors, etc.).

On the other hand, the Circular Economy Action Plan also includes a commitment to examine new options under the Ecodesign Directive, beyond energy-related products.

One example of this approach is the project developed by the Nordic Council of Ministers[4] to develop eco-design requirements for non-energy related products, using textiles and furniture

[3] Source: CEN/CLC/JTC 10

[4] https://www.norden.org/en/publication/potential-ecodesign-requirements-textiles-and-furniture

sector as examples. The proposed potential requirements for furniture were: Fitness for use; Provision of spare parts; Consumer information/instructions; Expected lifespan; Design for disassembly; Bill of materials and Packaging materials.

The Commission considers that "eco-design is one of the most effective ways to enhance security of energy supply and to reduce emissions of greenhouse gases and other pollutants". The Commission also estimates that the Ecodesign Directive, together with energy labelling, may contribute to around half of the energy savings target for 2020 (around 175 Mtoe primary energy per year by 2020).

Ecodesign and energy labelling measures should also bring important economic savings for end-users (save end-users of products around €100 billion per year in 2020 through lower utility bills, which is equivalent to up to €500 in yearly savings per household).

However, The European Parliament, the European Economic and Social Committee, and other stakeholders have urged the European Commission to come up with more ambitious plans concerning eco-design and the circular economy.

Some studies identified the following main obstacles for the Eco-design Directive[5]:

- The lack of political support at EU level for the progress and implementation of the Ecodesign Directive.
- The slow pace of the regulatory processes.
- The inadequacy of market surveillance within member states, which is considered a key factor for the success of the Directive. Such challenges can refer to costs, standards, testing methods, testing facilities, as well as lack of coordination among member states.

It is estimated that 10-25% of products on the market do not comply with ec-odesign and energy labelling requirements.

3.5. EXTENDED PRODUCERS RESPONSIBILITY (EPR SCHEMES)

The Extended Producer Responsibility (EPR) is "an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle"[6]

EPR is typically understood as a shift of responsibility (administratively, financially or physically) from governments or municipalities to producers, as well as an encouragement for producers to take into account environmental aspects during the designing and manufacturing phases of products.

In the European Union, EPR is mandatory within the context of the following Directives:

- Directive 2012/19/EU on WEEE (Waste of Electrical and Electronic Equipment)
- Directive 2006/66/EC on Batteries
- Directive 2000/53/EC on End-of-life vehicles

[5] EPRS.- European Parliamentary Research Service. PE 611.015. November 2017

[6] OECD definition

These Directives put the responsibility on producers for the financing of collection, recycling and responsible end-of-life disposal.

The Packaging and Packaging Waste Directive (94/62/EC) also indirectly invokes the EPR principle by requiring Member States (MS) to take necessary measures to ensure that systems are set up for the collection and recycling of packaging waste.

Other waste streams are also covered by EPR schemes at EU level, such as tyres, waste oil, paper and card, and construction and demolition waste.

However, at member state level, a much broader range of waste streams are subject to obligatory or voluntary EPR systems, for example farm plastics, medicines and medical waste, plastic bags, photo-chemicals and chemicals, newspapers, refrigerants, pesticides and herbicides, and lamps, light bulbs and fittings, furniture, etc..

Additionally, Article 8 of the Waste Framework Directive 2008/98 identifies some standards for EU Member states related to the EPR implementation, providing a reference scheme for its implementation.

In 2014, DG Environment published the final report on "Development of Guidance on Extended Producer Responsibility (EPR)", developed by BIO, which analyses the status of different EPR schemes at EU level, and finally define the guiding principles and recommendations.

There are also examples of **self-regulation** (or voluntary industry agreements) to funding infrastructures for increasing take-back, reuse and recycling practices. One example would be the case of WRAP in the **UK** (http://www.wrap.org.uk), which is working with businesses, local authorities and waste managers to create a resource efficient economy. It provides information and support for local authorities, materials facilities and reprocessors on collection, sorting and reprocessing techniques for particular materials, including: textiles, electricals, metals, plastics, glass, paper, wood, and bulky household items.

The most relevant EPR scheme for **furniture waste** is implemented in **France**. This system drives the collection, recycling and reuse of furniture arising from:

- the domestic waste stream, managed and operated by écoMobilier (https://www.eco-mobilier.fr)
- the commercial waste stream, managed and operated by Valdelia (http://www.valdelia.org/).

The main objectives of this scheme are:

- Reducing the waste furniture sent to landfill;
- Achieving a 45% recycling/reuse target; and
- Stimulate furniture manufacturers to adopt eco-design principles.

The scheme is supported through charges paid by furniture producers, retailers and importers, to cover the associated costs. As example, in 2015 the domestic EPR scheme collected 0.85M tonnes of domestic furniture, resulting in a 55% of recycling and 86% of recovery rate.

To promote the eco-design principles, Eco Modulation Criteria were created for the new furniture sold in the market, which allow lower levies charged to manufacturers (up to 20%) when they meet environmental product criteria.

3.6. HAZARDOUS SUBSTANCES / REACH REGULATION

The most relevant regulation related to hazardous substance at European level is the REACH Regulation (EC 1907/2006). Its objective is to improve the both human health and environment protection by identifying better and at an earlier stage the hazardous properties of chemical substances used in EU. Both manufacturers and importers have the responsibility to collect information on the specific and critical properties of chemical substances they use.

This regulation is based on four processes, which are:

1. Registration of substances
2. Evaluation of substances' risk
3. Authorisation to use under certain conditions, to ensure that substances of very high concern (SVHCs) are used safely
4. Restriction for some chemicals. imposing conditions on the manufacturing, placing on the market or use of substances;

The aim is to progressively substitute those chemical substances identified as the most dangerous (called "substances of very high concern") once identified suitable alternatives.

The processes are coordinated by the European Chemicals Agency (ECHA)[7], which takes care of the databases needed for operating the system, the co-ordination of the detailed analysis of critical and suspicious chemicals and the creation and maintenance of a public database accessible to professionals and consumers where these can find information about hazard substances.

In March 2018, a European Commission Communication (COM(2018) 116 final) made an evaluation of the progress of REACH Regulation. It stated that "REACH is fully operational and delivering results towards achieving its objectives. Although progress towards the objectives is lagging behind initial expectations, it has steadily improved as experience was gained".

The Communication identified some aspects that are slowing down the achievement of REACH objectives:

- the lack of compliant information in the registration dossiers
- the need of simplification of the authorization process
- the need to ensure a level playing field with non-EU companies through effective restrictions and enforcement. The number of new restrictions has so far not met the original expectations.
- the need to clarify the interface between REACH and other pieces of EU legislation; in particular with occupational safety and health (OSH) legislation and with waste legislation.

The main direct costs incurred under REACH so far are estimated at EUR 2.3-2.6 billion for the first two registration deadlines, which are associated with registration and the communication of information along the supply chain (higher than expected).

According to ECHA website, by July 2019:

[7] https://echa.europa.eu/

- ECHA received 96,814 dossiers for registration for approximately 22,569 unique registered substances, from 15,014 companies.
- the list of **restricted substances** (Annex XVII of REACH) includes 70 substances or group of substances.
- the **Candidate List** of Substances of Very High Concern for Authorization includes 201 substances or group of substances.
- the List of substances included in Annex XIV of REACH ("**Authorization List**") includes 43 substances or group of substances.

3.7. FORMALDEHYDE EMISSIONS

The formaldehyde produced and imported at European level is used according to the following distribution:

- Manufacturing resins (around 60%), which are used for producing a wide variety of articles for consumers. The main use of such resins is in the manufacturing of wood-based panels, as a bonding agent for wood particles. There are different typologies of these wood-based panels such as: plywood, particleboard, oriented strand board (OSB), medium density fibreboard (MDF), and other fibreboard (including hardboard and softboard).

Other wood-based products also use formaldehyde-based resins for their production, such as furniture, flooring and building elements for indoor and outdoor use.

- The production of a variety of products, such as: paints for industrial use, mineral wool, textile and leather, and foams for insulation of buildings and cars (the other 40%).

The exposure to formaldehyde emissions is an important issue for consumers (emissions from articles) and for workers (occupational exposure).

Considering the **emission from articles**, the **EN 13986** is the harmonised European standard for determining the formaldehyde emission from wood-based panels, which define the **classes E1 and E2** products. The **reference test method** is the **EN 717-1** standard.

These standards only classify the products, but it does not restrict the placing on the market of the worst class (i.e. E2 wood-based panels, with formaldehyde release >0.124 mg/m^3).

At European level, there is not a common legislative requirement associated to these classes, but since 2007, there is a voluntary industry agreement of the members of the European Panel Federation (EPF), which produce only class E1 wood-based panels (lower emissions than E2 class).

However, some **EU Member States** (i.e. Austria, Denmark, Germany, Greece, Italy, Lithuania, the Netherlands and Sweden) have adopted **national legislations** to limit formaldehyde emissions from wood-based panels. These legally binding emission limits generally correspond to the E1 emission class.

In the case of **German market**, starting from the 1st January 2020, the new **EN 16516** standard will be the reference method for the determination of formaldehyde emissions from raw and coated wood products. Despite the threshold limit remains numerically the same (class E1 (0.1 ppm)), the higher loading factor and the reduced air exchange compared to the current EN 717-1 standard, determines that the panels must have a much lower emission. The German law

allows to continue to use the standard EN 717-1 (European Chamber), but multiplying by two (2) the concentration value of formaldehyde measured at the steady state. Therefore, it is evident that the panels for the German market will have to have an emission level equal to half of the current E1 limit.

On the other side, under the REACH framework, there is a proposal, dated on January 2019, to restrict the placing on the market or the use of all articles releasing formaldehyde at concentrations greater than or equal to 0.124 mg/m^3. Nowadays, there is a public consultation process underway.

Regarding the emissions associated to occupational exposure, the European Council, Parliament and Commission agreed to limit the occupational exposure for formaldehyde at 0.3 ppm in Annex III of Directive 2004/37/EC.

Considering the US market, EPA and the California Air Resources Board (CARB) agreed that composite wood products sold, supplied, offered for sale, manufactured, or imported in the United States, between 1st of June 2018 and 22nd of March 2019, were required to be labelled as compliant of CARB ATCM Phase II or TSCA Title VI. After March 22, 2019, composite wood products must be labelled as TSCA Title VI compliant. The final rule also established a third-party certification program for laboratory testing.

3.8.EU'S RULES ON END OF LIFE WASTE CRITERIA

The objective of end-of-waste criteria is to remove the administrative burdens of waste legislation for safe and high-quality waste materials, in order to facilitate their recycling. This objective is achieved by requiring recyclable materials of high quality, promoting product standardisation and quality assurance, and improving harmonisation and legal certainty in the recyclable material markets.

The Waste Framework Directive 2008/98/EC, in its Article 6 (1) and (2), indicates that some specific waste shall stop to be considered normal waste if it has undergone through a recovery process (including recycling) and if it complies with specific criteria developed in line with certain legal conditions. The criteria include:

- the substance or object is commonly used for specific purposes;
- there is an existing market or demand for it;
- the use is legally allowed (it fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products);
- its use will not cause any negative environmental or human health impacts.

Such criteria should be set for specific materials by the Commission using the procedure described in Article 39(2) of the Waste Framework Directive. This procedure is based on a methodology and guidelines developed by the Joint Research Centre (JRC), which have carried out two main reports:

- 'Study on the selection of waste streams for end-of-waste assessment'.
- 'End-of-waste criteria, methodology and case studies'.

Based on them, technical studies have been developed for:

- End-of-waste Criteria for Iron and Steel Scrap: Technical Proposals
- End-of-waste Criteria for Aluminium and Aluminium Alloy Scrap: Technical Proposals
- End-of-waste Criteria for Waste Paper: Technical Proposals

- End-of-waste Criteria for Copper and Copper Alloy Scrap: Technical Proposals
- End-of-waste Criteria for Glass Cullet: Technical Proposals
- End-of-waste Criteria for Biodegradable waste (compost/digestate): Technical Proposals
- End-of-waste Criteria for Waste Plastic: Technical Proposals

Nowadays, the criteria have been laid down for:

- iron, steel and aluminium scrap (see Council Regulation (EU) No 333/2011)
- glass cullet (see Commission Regulation (EU) N° 1179/2012)
- copper scrap (see Commission Regulation (EU) N° 715/2013)

Regarding the furniture sector, wood waste stream (partially from furniture) has been analysed in the first mentioned study of JRC, considering the wood waste stream as stream that may be in line with the principles, but it is not clear for all cases that their current management in the EU takes place via recycling, or that recycling is a priority compared to controlled energy recovery or landfill in suitable facilities (more detailed information is needed to define it as a priority).

3.9. FLAME RETARDANTS

In April 2004, the European Union (EU) published the Regulation (EC) 850/2004, a comprehensive piece of legislation for the management of persistent organic pollutants (POPs) listed in the Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on POPs and the Stockholm Convention on POPs. Some of these POPs are used as flame retardants (for example PBDE flame retardants).

On June 25, 2019 the EU published the Regulation (EU) 2019/1021, which recast the POPs Regulation. This new law contains several important changes, for example completely new entries for decabromodiphenyl ether (Deca-BDE) and, pentachlorophenol (PCP) and its salts and esters in Part A of Annex I; with some exemptions for Deca-BDE, including electrical and electronic equipment within the scope of Directive 2011/65/EC (RoHS II).

Some furniture products use flame retardants to fulfil the different flammability standards for furniture. Some of these standards require compliance with open flame tests, forcing the use of flame retardants, despite this use is not legally required.

Countries such as UK, Ireland, Germany, France, Portugal, Spain, Italy, Norway, Sweden and Finland have introduced fire requirements for loose furnishings. These requirements mainly cover public areas such as hospitals, prisons, hotels, theatres etc. However, for the domestic environment most countries lack fire requirements. Only UK, Ireland and in less extend the Nordic countries have fire requirements for the domestic environment.

The most stringent legislation for fire safety controls are in the UK and Ireland, where products have to pass ignitability and flammability tests (Furniture and Furnishings Regulations (FFRs)). The regulations are now under review, with the objective of maintaining existing fire safety levels but with reduced FR use.

The main problems associated to some of these flame retardants are:

- They can cause harm to human health and environment, because they can come out of the product and they are persistent compounds
- They put at risk furniture products quality
- They create an expensive burden for furniture producers

- They can limit the product lifespan, because they can reduce the duration of the product
- They are an obstacle for the circular economy transition, because they prevent many products to be safely recycled for their material reuse
- They make the end-of-life treatment of furniture waste more expensive and riskier, because they risk releasing toxics fumes during end-of-life treatment
- They can generate toxic fumes in case of fire

As mentioned, there is not legislation regulating the specific use of flame retardants in the furniture sector, and the use of this type of chemical substances are associated to the possible requirements fixed by the REACH Regulation and POPs Regulation. However, furniture has to comply with safety requirements, independently of the method use to fulfil these requirements.

At European level, environmental and health NGOs, the industry, cancer organizations, fire fighters and labour unions joined effort in The Alliance for Flame Retardant Free Furniture in Europe[8], with the aim to stop the use of flame retardants in furniture products, supporting safer alternative ways of minimising fire risks.

3.10. RENEWABLE ENERGY DIRECTIVE

The original renewable energy directive (2009/28/EC) establishes an overall policy for the production and promotion of energy from renewable sources in the EU. It requires the EU to fulfil at least **20% of its total energy needs with renewables by 2020** – to be achieved through the attainment of individual national targets, taking into account its starting point and overall potential for renewables. These targets range from a low of 10% in Malta to a high of 49% in Sweden. On the other hand, all EU countries must also ensure that at least **10% of their transport fuels come from renewable sources by 2020**.

Every two years, EU countries report on their progress towards the EU's 2020 renewable energy goals. Based on the national reports and on other available data, the European Commission produces a EU-wide report which gives an overview of renewable energy policy developments in EU countries.

The latest EU-wide report, published in 2017 (based on the 2015 national reports and other data), highlight the following key findings:

- In its final energy consumption, the EU as a whole achieved a 16% share of renewable energy in 2014 and an estimated 16.4% share in 2015.
- The vast majority of EU countries are well on track to reach their 2020 binding targets for renewable energy, but all countries will have to continue their efforts to meet these targets.

[8] http://www.safefurniture.eu

- The transport sector achieved the 6% use of renewable energy in 2015, so some EU countries will have to intensify their efforts to reach the 10% binding target for transport by 2020.

The Joint Research Centre (JRC) has created a portal that provides access to the data from the Member States renewable energy actions submitted under the 2009 renewables directive as well as a visualisation of the progress towards the targets[9].

In December 2018, the **revised renewable energy directive 2018/2001/EU** entered into force, as part of the Clean energy for all European packages, aimed at keeping the EU a global leader in renewables and, more broadly, helping the EU to meet its emissions reduction commitments under the Paris Agreement.

The new directive establishes a new binding renewable energy target for the EU **for 2030 of at least 32%,** with a clause for a possible upwards revision by 2023.

EU countries are required to draft 10-year National Energy & Climate Plans (NECPs) for 2021-2030, outlining how they will meet the new 2030 targets for renewable energy and for energy efficiency. Member States needed to submit a draft NECP by 31 December 2018 and should be ready to submit the final plans to the European Commission by 31 December 2019.

Most of the other new elements in the new directive need to be transposed into national law by Member States by 30 June 2021.

The Renewable Energy Directive sets out biofuels sustainability criteria for all biofuels produced or consumed in the EU to ensure that they are produced in a sustainable and environmentally friendly manner.

Companies can show they comply with the sustainability criteria through national systems or so-called voluntary schemes recognised by the European Commission. These schemes check that:

- production of biofuel feedstock does not take place on land with high biodiversity;
- land with a high amount of carbon has not been converted for biofuel feedstock production;
- biofuel production leads to sufficient greenhouse gas emissions savings.

The biofuels industry is then put under pressure, because of the booming demand for alternative fuels and the restriction of sustainability criteria. Therefore, it is analysing the potential use of raw materials for second-generation biofuels in different **waste streams**, agricultural residues and forestry-based biomass. **Wood-based panels and furniture** represent model examples of the Circular Economy because at the end of their material life, these can still become an input for renewable energy production.

[9] https://ec.europa.eu/jrc/en/scientific-tool/nreap-data-portal

3.11. ILLEGAL LOGGING AND ILLEGAL TIMBER TRADE

The Regulation (EU) No 995/2010 of the European Parliament and of the Council of 20 October 2010 defines the obligations of operators selling or distributing timber and timber products. It is known as the EU Timber Regulation or EUTR.

It came into force in 2013 forbidding the placing of illegally harvested timber in the European market. The regulation is a major part of the EU's effort to reduce deforestation and protect at risk tree species as part of the EU Forest Law, Enforcement, Governance and Trade (FLEGT) Action Plan.

It applies to timber harvested in both the EU and internationally, obligating businesses to assess and mitigate any risks that the timber used for their products has come from an illegal source.

The Regulation relates to a wide typology of timber products among which we find: solid wood products, flooring, plywood, pulp and paper. Products currently EXCLUDED from the regulation are:

- Recycled/waste products,
- Packaging used to protect or carry another product placed on the market,
- Printed matter – books, magazines, photos where the print itself is the product. (NOTE – other types of paper or tissue is included),
- Certain bamboo products – Plaited or woven bamboo, pulp and paper from bamboo, seats made from bamboo,
- Seated furniture – including sofas, chairs,
- Medical furniture.

It foresees that the list of products can be revised if needed.

The regulation affects two types of businesses:

- Operators - Any person or business who first places timber on the market. Operators' must maintain records of any traders that supply timber to them and implement a due diligence system to assess and potentially mitigate the risks that illegally harvested timber enters their supply chain.
- Traders - Any person or business who sells or buys timber or timber products that have already been placed on the EU market. As a trader you must maintain and keep records for at least five years of 1) those who supplied the timber product to you 2) those you have supplied the timber products to you.

The EU implemented a **voluntary scheme** called the **FLEGT Action Plan** to guarantee the timber imported to the EU is legally harvested in those countries that take part in this scheme. The EU FLEGT Regulation was adopted in December 2005 (Council Regulation (EC) No 2173/2005 of 20 December 2005), and a 2008 Implementing Regulation (Commission Regulation (EC) No 1024/2008 of 17 October 2008).

It defines the legal framework to control the EU timber imports from countries that signed bilateral FLEGT Voluntary Partnership Agreements (VPA) with the EU. Annual Synthesis Reports are published to monitor the effectiveness of the scheme. More information can be found at http://www.flegt.org/.

Another scheme is the **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES),** which was signed in 1973. Its objective is to protect and do not threat a variety

of more than 30.000 wild animals and plants with different degrees of protection, limiting the international trade of a variety of animals and plants. It requires that the trade of these selected species is kept under control. It includes the requirement of having a specific licence that authorizes the import and export of the species covered by this convention.

In July 2019, the European Commission published the communication COM(2019) 352 final about "Stepping up EU Action to Protect and Restore the World's Forests". The EC has set out five priorities:

- Reduce the EU consumption footprint on land and encourage the consumption of products from deforestation-free supply chains in the EU;
- Work in partnership with producing countries to reduce pressures on forests and to "deforest-proof" EU development cooperation;
- Strengthen international cooperation to halt deforestation and forest degradation, and encourage forest restoration;
- Redirect finance to support more sustainable land-use practices;
- Support the availability of, quality of, and access to information on forests and commodity supply chains, and support research and innovation.

The Commission also proposes in this Communication the creation of an EU Observatory on Deforestation and Forest Degradation, to monitor and measure changes in the world's forest cover and associated drivers.

4. VOLUNTARY INSTRUMENTS

4.1. GREEN PUBLIC PROCUREMENT (GPP)

The European Commission's communication on Public procurement for a better environment (COM (2008) 400) defines GPP as: "a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured."

Thus, Green public procurement incorporates environmental criteria in the specifications of a public tender. On other words, green public procurement involves the integration of the environmental components into public procurement decisions.

GPP can foster the creation of a critical demand mass of more sustainable goods and services, which otherwise would not be easy to get onto the market. Therefore, it can support EU's efforts to become a more resource-efficient economy and to stimulate eco-innovation.

These environmental criteria could cover different aspects of the products during their life cycle, such as their content, their packaging, their recyclability, the waste they can generate and many other environmental aspects, such as whether they are or not in possession of an ecolabel. In this sense, EU Commission tries to include more Circular Economy criteria, such as easy dismantling, repair, durability, recycled content, etc.

The European Commission aimed to ensure that 50% of all public tender procedures include environmental criteria by 2010. However, according to the report "Monitoring the Uptake of GPP in the EU (2012), this target was not met.

The European Commission and several EU countries have prepared different guidelines for GPP processes, in the form of national GPP criteria. The main challenges are to ensure compatible GPP requirements between different EU countries and to foster more public sector bodies to adopt these criteria.

The Table 7 summarises the status of the National Action Plans on May 2017[10].

Table 7.- Status of National Action Plans on GPP in Europe

National Action Plan or equivalent document adopted	23 Countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, Latvia, Lithuania, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, UK
No existing NAP	5 Countries: Estonia, Greece, Hungary, Luxembourg, Romania

On average, public procurement accounted for 13.1 % of the GDP in 2015 in the EU.

There are several initiatives at European level to promote GPP, for example:

- PROCURA+ EUROPEAN SUSTAINABLE PROCUREMENT NETWORK. Initiated and coordinated by ICLEI, Procura+ is a network of European public authorities and regions that connect, exchange and act on sustainable and innovation procurement. (http://www.procuraplus.org/)
- GPP 2020 aimed to mainstream low-carbon procurement across Europe in support of the EU's goals to achieve a 20% reduction in greenhouse gas emissions, a 20% increase in the share of renewable energy and a 20% increase in energy efficiency by 2020. To this end, GPP 2020 implemented more than 100 low-carbon tenders, which directly resulted in substantial CO_2 savings. Moreover, GPP 2020 ran a capacity building programme that included trainings and exchange. (http://www.gpp2020.eu/home/)
- SPP Regions promoted the creation and expansion of European regional networks of municipalities working together on Sustainable Public Procurement (SPP) and Public Procurement of Innovation (PPI). (http://www.sppregions.eu/home/)

Regarding the furniture sector, EU studies found that the purchasing of office furniture by the public sector represents 15% of the EU market. For example, government procurement (excluding wider public sector) in the UK represents approximately 10% of the office furniture market.

The Table 8 shows the situation of GPP criteria for furniture products in different countries[11].

Table 8.- Status of GPP criteria for furniture in EU countries

[10] https://ec.europa.eu/environment/gpp/action_plan_en.htm

[11] Source: JRC – 2017. Revision of the EU Green Public Procurement (GPP) criteria for Furniture

Direct recommendation of EU GPP criteria	Development of specific national GPP criteria	No recommendation of any GPP criteria
Belgium	Austria	Bulgaria
Cyprus	Czech Republic	Croatia
Denmark	Finland (under development)	Estonia
Latvia	France	Greece
Poland	Germany	Ireland
Slovakia	Italy	Hungary
Slovenia	Lithuania	Luxemburg
	Malta	Portugal
	Netherlands	Romania
	Norway	
	Spain	
	Sweden	
	UK	

An updated version of the EU GPP criteria for furniture was published in August 2017, in parallel with the revision of the EU Ecolabel criteria for this type of products. The environmental aspects covered by these criteria are the following:

At raw materials level:

- The origin of wood from sustainably managed forests.
- The inclusion of a fraction of recycled material in metals and plastics.
- Environmental improvement measures in fabrics and foams.
- The levels of formaldehyde emissions in particleboard and fibreboard.
- Emissions of volatile organic compounds in paints and varnishes.
- During the manufacturing, the non-use of chemicals processes classified as carcinogenic, harmful to the reproductive system, toxic or allergenic (when inhaled).

At the product level:

- The maximum durability of the furniture.
- The easy and correct maintenance of the furniture.
- The dismantling of the product at the end of its useful life.
- The packaging material and its correct removal and final management.

An example of how to potentiate the use of GPP on furniture sector is the GPP-FURNITURE project (http://www.gpp-furniture.eu). It is an innovative and open learning resource for professionals of the furniture industry to expand their knowledge and provide added value for the Green Public Procurement.

Several examples can be found at EU level about the application of GPP criteria for furniture. One example could be the procurement of refurbished school furniture in Aalborg – Denmark.

In 2017, Aalborg Municipality launched an ambitious project aimed at refurbishing and recycling the old school furniture for the benefit of both the schools' budget and the environment. As part of the market dialogue, the city had 7 meetings with suppliers to determine and prepare them for circular procurement criteria. As minimum criteria to ensure circularity the municipality used the following:

- 5 years warranty on lifetime of new furniture
- 2 years warranty on lifetime of refurbished furniture
- 5 years warranty on spare parts.
- Packaging has to be recyclable (paper, wood etc.).
- Plastic parts above 50 grams have to be labelled for recycling.
- 70 % of used wood has to be sustainable e.g. FSC, PFFC or reused wood.
- New and refurbished furniture have to be labelled with supplier logo.

As part of the award criteria, circularity accounted for 40 % and it was based on lifetime (30 %), service and maintenance (25 %), reuse (20 %), refurbishment (15 %) and material recycling (10 %).

4.2.ENVIRONMENTAL MANAGEMENT IN ORGANIZATIONS

An environmental management system can help organizations in the identification, management, monitoring and control of their environmental aspects in a "holistic" manner.

At European level there are two main certified Environmental Management Systems, which are EMAS and the ISO-14001:2015.

EMAS[12]

The EU Eco-Management and Audit Scheme (EMAS) is a premium management instrument developed by the European Commission for companies and other organisations to evaluate, report and improve their environmental performance. EMAS is open to every type of organisation eager to improve its environmental performance. It spans all economic and service sectors and is applicable worldwide.

EMAS helps organisations optimise their internal processes, achieve legal compliance, reduce environmental impacts, and use resources more efficiently. All kinds of organisations – public and private, large multi-national companies as well as small and medium sized enterprises (SMEs) with few financial resources and limited in-house environmental management expertise – can enjoy the benefits.

The EMAS Regulation 1836/93 was first introduced in July 1993 as an environmental policy tool devised by the European Commission in a step towards fulfilling the Community's goal of sustainable development. EMAS has been open for voluntary participation by organisations since April 1995. Its scope initially restricted participation to companies in the industrial sector.

[12] http://ec.europa.eu/environment/emas/index_en.htm

In 2001 the revised Regulation (EC) No 761/2001 ("EMAS II") was adopted. Its main elements were the extension of the scope of EMAS to all sectors of economic activity including local authorities, and the integration of the international environmental management system standard EN ISO 14001.

In 2009 the EMAS Regulation was revised and modified for the second time. Regulation (EC) No 1221/2009 ("EMAS III") came into effect on 11 January 2010.

In 2017 Annexes I, II and III of the EMAS Regulation were amended to include the changes associated with the revision of the ISO 14001:2015 standard. The Commission Regulation (EU) 2017/1505 amending these annexes entered into force on 18/09/2017.

Since January 9th 2019, also an amended Annex IV of the EMAS regulation (EU Commission Regulation EU 2018/2026) is in place. This amendment includes an update of EMAS' core indicators and the language of the environmental statement. It also offers EMAS organisations new opportunities to report on their environmental performance and to use the organisation's EMAS environmental statement also for other reporting obligations.

The Table 9 summarises the situation of EMAS registration in EU countries (April 2019)[13]:

Table 9.- Situation of EMAS registration in EU Countries

Country	Organisations	Sites	Country	Organisations	Sites
Austria	253	1159	Italy	967	4839
Belgium	76	745	Lithuania	4	6
Bulgaria	15	29	Luxembourg	5	8
Croatia	1	2	Latvia	0	0
Cyprus	67	67	Malta	1	1
Czech Rep.	20	46	Netherlands	1	1
Germany	1176	2226	Norway	5	14
Denmark	21*	188*	Poland	66	367
Estonia	5	32	Portugal	51	96
Spain	842	1030	Romania	6	10
Finland	4	22	Sweden	13	13
France	31	45	Slovenia	9	13
Greece	37	1334	Slovakia	6	37
Hungary	27	50	UK	18	19
Ireland	1	1	**Total**	**3728**	**12409**

* Numbers from EU EMAS Register
Source: Official responses from national Competent Bodies

From these, there are 35 registered organisations related to the **furniture sector** (NACE code 31), most of them in Germany (24 organisations).

The Commission has developed several guidelines and supporting tool to promote the use of EMAS scheme:

- Guidelines & Tools

[13] Source: https://ec.europa.eu/environment/emas/emas_registrations/statistics_graphs_en.htm

- The Sectoral Reference Documents (SRDs) on Best Environmental Management Practice provide guidance and inspiration to organisations in specific sectors on how to further improve environmental performance. Sectors: Retail trade; Tourism; Food and Beverage Manufacturing; Car Manufacturing; Electrical and Electronic Equipment Manufacturing; Public Administration; Agriculture; Construction; Waste Management; Manufacture of fabricated metal products (on going) and Telecommunications (on going)

ISO-14001:2015[14]

ISO 14001 is an internationally agreed standard that sets out the requirements for an environmental management system. It helps organizations improve their environmental performance through a more efficient use of resources and reduction of waste, gaining a competitive advantage and the trust of stakeholders.

ISO 14001 is suitable for organizations of all types and sizes, be they private, not-for-profit or governmental. It requires that an organization considers all environmental issues relevant to its operations, such as air pollution, water and sewage issues, waste management, soil contamination, climate change mitigation and adaptation, and resource use and efficiency.

Like all ISO management system standards, ISO 14001 includes the need for continuous improvement of the organization's systems and of the approach to environmental concerns.

The standard has recently been revised (2015), with key improvements such as the increased prominence of environmental management within the organization's strategic planning processes, greater input from leadership and a stronger commitment to proactive initiatives that boost environmental performance. It includes also a more life cycle thinking approach.

The situation of ISO-14001 registered organisations in Europe (2017) is indicated in the Table 10[15]: In total, there are 111,133 organisations registered in this standard.

Table 10.- Situation of ISO-14001 registrations in Europe (2017)

Country	Number	Country	Number
Albania	70	Latvia	373
Andorra	17	Liechtenstein	44
Armenia	4	Lithuania	779
Austria	1168	Luxembourg	119
Azerbaijan	68	Malta	35
Belarus	336	Moldova, Republic of	5
Belgium	1063	Monaco	21
Bosnia and	247	Montenegro	17
Bulgaria	1820	Netherlands	2739
Croatia	966	Norway	1319

[14] https://www.iso.org/obp/ui#iso:std:iso:14001:ed-3:v1:en

[15] Source: https://www.iso.org/the-iso-survey.html

Country	Number	Country	Number
Cyprus	271	Poland	2885
Czech Republic	4312	Portugal	1475
Denmark	1128	Romania	5555
Estonia	562	Russian Federation	799
Finland	1480	San Marino, Republic of	5
France	6318	Serbia	887
Georgia	13	Slovakia	1485
Germany	12176	Slovenia	450
Gibraltar (UK)	4	Spain	13053
Greece	1520	Sweden	4829
Hungary	2195	Switzerland	2856
Iceland	90	Republic of Macedonia	232
Ireland	989	Turkey	2001
Italy	14571	Ukraine	223
Kosovo		United Kingdom	17559

In this case, it was not possible to identify the number of those organisations that belong to the furniture sector. The nearest reported classification is "manufacture of wood and wood products", which are presented in the Table 11 (year 2017).

Table 11.- ISO-14001 certifications for "manufacture of wood/wood products" sector in Europe

Country	Number	Country	Number
Andorra		Lithuania	9
Armenia		Luxembourg	
Austria	7	Macedonia	
Azerbaijan		Malta	
Belarus	6	Moldova (Republic of)	
Belgium	2	Monaco	
Bosnia and Herzegovina	2	Montenegro	1
Bulgaria	33	Netherlands	57
Croatia	5	Norway	8
Denmark		Poland	6
Estonia	10	Portugal	19
Finland	12	Romania	39
France	17	Russian Federation	
Georgia		San Marino	
Germany	8	Serbia	14
Gibraltar		Slovakia	8

Country	Number	Country	Number
Greece	5	Slovenia	1
Hungary	9	Spain	49
Iceland		Sweden	68
Ireland	8	Switzerland	42
Italy	13	Turkey	9
Kosovo		Ukraine	1
Latvia	11	United Kingdom	62

4.3.ECO DESIGN METHODOLOGY

Eco-design is defined as “the integration of environmental aspects into product design and development with the aim of reducing adverse environmental impacts throughout a product’s life cycle”.

It refers to innovative design solutions in both products and services that take into consideration the entire lifecycle – from the extraction of raw materials to production, distribution and use – all the way to recycling, “reparability”, and disposal.

Eco-design initiatives, mandatory and voluntary, can help significantly in terms of life extension, both directly and by enabling repairing and remanufacturing.

The UNE-EN ISO 14006:2011 on Environmental management systems - Guidelines for incorporating eco-design provides guidelines to assist organizations in establishing, documenting, implementing, maintaining and continually improving their management of eco-design as part of an environmental management system (EMS).

The standard is intended to be used by those organizations that have implemented an EMS in accordance with ISO 14001, but can help integrating eco-design in other management systems. The guidelines are applicable to any organization regardless of its size or activity.

It applies to those product-related environmental aspects that the organization can control and those it can influence, but does not establish by itself specific environmental performance criteria, and it is not intended for certification purposes.

Nowadays is under revision (enquiry process - ISO/DIS).

AENOR indicates the following benefits for the organisation and its clients:

Internal benefits for the organisation:

- It is a guarantee that the organisation complies with the environmental legislation that applies to it, including the legal environmental requirements referring to its products and/or services.
- It is a guarantee that the organisation manages the design and development of its products and/or services in such a way that they continue to improve their performance in relation to their impact on the environment.
- Cost reductions (consumption of materials, improvements to containers and packaging, etc.)

Benefits for the clients:

- Product innovation leading to differentiation within the relevant market.
- Responding to clients' needs and expectations. For example, in bidding for tenders.
- Improving the image of the product and of the organisation itself.

Despite it can be found examples of organisations that claim that are certified by ISO-14006, it was not possible to find statistics about the number of organisations certified at European level with this standard. We need to mention that the standard indicates that it is not intended for certification purposes.

There are also another relevant standards regarding eco-design:

- The UNE-ISO/TR 14062:2007 IN on Environmental management. Integrating environmental aspects into product design and development (ISO/TR 14062:2002). It describes concepts and current practices related to the integration of environmental aspects into product design and development. It is applicable to the development of sector-specific documents, but it is not applicable as a specification for certification and registration purposes.
- The IEC 62430:2019 Environmentally conscious design (ECD) - Principles, requirements and guidance. It describes principles, specifies requirements and provides guidance for organizations intending to integrate environmental aspects into the design and development in order to minimize the adverse environmental impacts of their products, but it does not provide requirements for assessing the conformity of specific products. It replaces the 2009 edition, which applies only to electrotechnical products and systems. This new edition covers all products, including services.

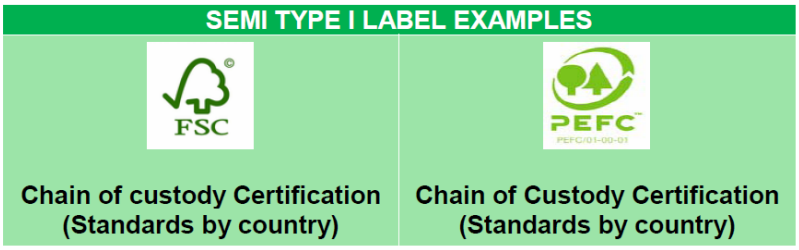
4.4. ECO LABELS (TYPE I, II, AND III)

There are a huge amount of different ecolabels (see http://www.ecolabelindex.com/), but all of them could be included in three main types of ecolabels and they are regulated under de ISO 14020 - Environmental labels and declarations. General principles series:

- ISO 14024. Environmental labels and declarations. Type I environmental labelling. Principles and procedures.
- ISO 14021. Environmental labels and declarations. Self-declared environmental claims (Type II environmental labelling).
- ISO 14025. Environmental labels and declarations. Type III environmental declarations.

Ecolabelling of type I is based on the evaluation of several criteria of life cycle by a third party, which grants a licence justifying the use of ecolabels with products of a particular product group.

Examples of this type of ecolabels could be:



Ecolabelling of type II is a self-declaration of environmental predication by producer, importer, distributor, retailer or anybody who benefits from the predication. In this case, this declaration is not certified or approved by a third party.

Ecolabelling of type III, called Environmental Labels and Declarations (ELD) need to be based on the evaluation of the product life cycle (LCA). It needs to be certified by an impartial third party.

a) EU Ecolabel scheme

Inside the Type I, at European level, it is the most recognised one. Launched in 1992, the EU Ecolabel scheme promotes the production and consumption of products that have a reduced environmental impact in comparison to existing products on the market. Because the scheme works on a European level, it goes beyond the pre-existing national ecolabels that are often only known within national borders. The Product Categories covered by EU ecolabel scheme are:

Table 12.- List of product categories covered by EU ecolabel

Absorbent hygiene products	Hard coverings	Personal, Notebook and Tablet Computers
Bed Mattresses	Hard Surface Cleaning Products	Printed paper
Converted paper	Indoor Cleaning Services	Rinse-off Cosmetic Products
Detergents for Dishwashing	Industrial and Institutional Laundry Detergents	Televisions
Footwear	Industrial and Institutional Automatic Dishwasher Detergents	Textile products
Furniture	Laundry Detergents	Tourist Accommodation
Graphic paper, Tissue paper and tissue products	Lubricants	Wood-, cork- and bamboo-based floor coverings
Growing media, soil improvers and mulch	Newsprint paper	
Hand Dishwashing Detergents	Paint and Varnishes	

Under development: Financial products, Food and feed products and Office Buildings.

As of March 2019, 1,575 licences have been awarded for 72,797 of products and services available on the market, thus showing an increase by 88%, since 2016, of the number of EU Ecolabelled products/services.

Product groups for which highest growth in product numbers is registered from the last reporting period (November 2018) are: copying and graphic paper, tissue paper, paints and varnishes, textiles.

In March 2019, the most licences were awarded in France (19.5%), Germany (18%), and Spain (12%). The Figure 1 shows the number of licences per EU countries[16]:

[16] Source: https://ec.europa.eu/environment/ecolabel/facts-and-figures.html

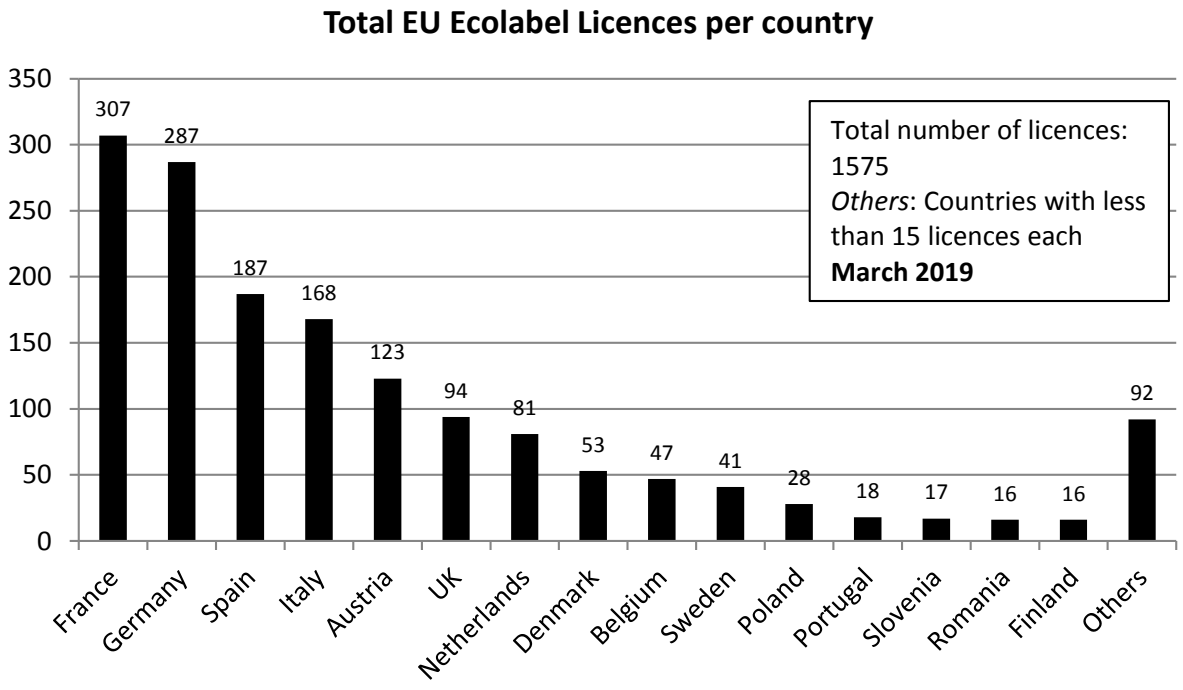


Figure 1.- Number of products/services awarded with EU ecolabel in Europe

If we look at the number of products/services awarded, the majority of products/services were awarded in Spain (42.5%), Italy (12%), and Germany (6%).

EU Ecolabel for **Furniture products** meet criteria that guarantee:

- Wood, cork, bamboo and rattan from sustainably managed forests
- Restricted hazardous substances
- Low formaldehyde emission product
- Low VOC emission product
- Product designed for disassembly and ease of repair

The criteria are published on the Commission Decision (EU) 2016/1332 of 28 July 2016 establishing the ecological criteria for the award of the EU Ecolabel for furniture (notified under document C(2016) 4778).

Regarding the furniture sector, in March 2019, 2 licences were awarded (42 products).

b) Blue Angel[17]

Regarding the **furniture sector**, the Blue Angel ecolabel has criteria for Low Emission Upholstered Furniture (DE-UZ 117) and for Low-Emission Furniture and Slatted Frames made of Wood and Wood-Based Materials (DE-UZ 38).

[17] https://www.blauer-engel.de/en

The first one includes 9 products from 5 companies and the second one a total of 87 products from 33 companies (September 2019).

c) Nordic Swan[18]

The Nordic Swan has ecolabel criteria for **Furniture and fitments**, which covers a wide range of product types - such as chairs, tables, couches, office furniture, beds, mattresses, interior doors and kitchen/ bathroom fittings, and for **Outdoor furniture** and playground equipment.

d) NF Environment[19]

The NF Environment has ecolabel criteria for the following categories related to furniture sector:

– CONTRACT FURNITURE (NF372)

– HOUSEHOLD FURNITURE OR DOMESTIC FURNITURE (NF022)

– OFFICE FURNITURE (NF293)

– FURNITURE (NF217)

e) EPD System[20]

This Type III ecolabel requires the development of a Life Cycle Assessment, following a set of requirements fixed in the Product Categories Rules of the product family, and the verification by a third party.

There are published 40 EPDS worldwide, associated to the category **Furniture & other goods**. Most of them from one unique manufacturer (i.e. Koleksiyon Mobilya Sanayi A.S.- Turkey), with 32 EPDs.

f) Organisation and Product Environmental Footprint[21]

DG Environment has worked together with the European Commission's Joint Research Centre (JRC-IES) and other European Commission services on the development of a harmonised methodology for the calculation of the environmental footprint of products and organisations.

The final methods, called Product Environmental Footprint (PEF) and Organisation Environmental Footprint (OEF), were published as an Annex of the Commission Recommendation (2013/179/EU) on the use of common methods to measure and communicate the life cycle environmental performance of products and organisations.

Pilot cases have been carried out to develop the needed Product Environmental Footprint Category Rules (PEFCRS) and Organisation Environmental Footprint Sector Rules (OEFSRs), with the involvement of voluntary stakeholders.

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[18] http://www.nordic-ecolabel.org/

[19] http://marque-nf.com/nf-environnement/

[20] https://www.environdec.com

[21] https://ec.europa.eu/environment/eussd/smgp/ef_pilots.htm

The developed pilot cases for products have been:

Batteries and accumulators; Decorative paints; Hot and cold water supply pipes; Household detergents; Intermediate paper products; IT equipment; Leather; Metal sheets; Footwear; Photovoltaic electricity generation; Stationery; Thermal insulation; T-shirts; Uninterruptible Power Supply; Beer; Coffee; Dairy; Feed for food-producing animals; Marine fish; Meat (bovine, pigs, sheep); Olive oil; Packed water; Pasta; Pet food (cats & dogs) and Wine.

In the case of Organisation, the pilots have been:

Retail and Copper production.

4.5.CHAIN OF CUSTODY CERTIFICATION

Timber supply Chain of Custody certification provides evidence that the certified product originates from certified, well managed forests. It verifies and ensures that these products are not mixed with other products from no-certified forests at any point along the supply chain, except under strict controls and when percentage (%) labelling is being used.

Demand for chain of custody certification has grown dramatically in the last three years to the extent that, for many companies, the ability to prove that a timber product has been derived from a well-managed source is now a key factor in the specification of timber and paper products.

There are currently two independently accredited chains of custody programmes operating in the Timber Industry: The FSC (Forest Stewardship Council) scheme and the PEFC (Programme for the Endorsement of Forest Certification) scheme. Some other National schemes also exist, but there are less extended.

We have to mention also the standard ISO 38200:2018: Chain of custody of wood and wood-based products, which specifies requirements for a chain of custody of wood and wood-based products, cork and lignified materials other than wood, such as bamboo, and their products. This standard is applicable to materials that originate from different categories of input materials and can derive from mechanical, chemical, biological and/or thermal processing or a combination thereof and it is intended to enable tracking of material from different categories of source to finished products. It specifies minimum requirements for input materials, but it is not applicable to forest management.

Chain of Custody certification is required whenever a company carries out any material alteration to the timber/product, or whenever they take physical or legal ownership of the timber/product.

FSC (Forest Stewardship Council)[22]

FSC was born out of the willing to make forest management environmentally responsible, socially beneficial, and economically viable for the long term.

[22] https://ic.fsc.org/en

One of its first acts was to develop a set of rules – the first of its kind in **forest management** – that would define best practices and help forest owners and managers anywhere in the world to work towards that goal in the same way. These are the **FSC Principles & Criteria** (FSC P&C).

FSC forest management certification confirms that the forest is being managed in a way that preserves the natural ecosystem and benefits the lives of local people and workers, all while ensuring it sustains its economical viability.

Certification is achieved by passing an assessment carried out by an FSC-accredited certification body, with forest management conformity assessed against the FSC Principles and Criteria

FSC chain of custody certification verifies that FSC-certified materials have been identified and separated from non-certified and non-controlled materials as they advance along the supply chain. To achieve the chain of custody certification, the business has to meet FSC-STD-40-004 Chain of Custody Certification standard.

The **FSC Recycled label** denotes that a product is made entirely from recycled or reclaimed material, subject to requirements concerning the purchasing, verification, and classification of the reclaimed material. At least 85 per cent of reclaimed material must be verified as having been recycled following consumer use to qualify for the FSC Recycled label.

The Table 13 shows the Global FSC-certified Area and Number of Certificates: by country in Europe[23], in August 2019.

Table 13.- Global FSC-certified Area and Number of Certificates: by country in Europe (2019)

Country	Total Area (ha)	No.	% Area
Austria	587	2	0,0%
Belarus	8,960,851	67	8,8%
Belgium	27,735	3	0,0%
Bosnia and Herzegovina	1,768,071	8	1,7%
Bulgaria	1,460,403	25	1,4%
Croatia	2,048,581	4	2,0%
Czech Republic	72,849	8	0,1%
Denmark	214,912	4	0,2%
Estonia	1,528,966	9	1,5%
Finland	1,623,311	8	1,6%
France	63,237	9	0,1%
Germany	1,355,612	56	1,3%
Hungary	305,170	6	0,3%

[23] Source: https://fsc.org/en/page/facts-figures

Country	Total Area (ha)	No.	% Area
Ireland	446,873	4	0,4%
Italy	65,723	18	0,1%
Latvia	1,105,617	16	1,1%
Lithuania	1,180,846	31	1,2%
Luxembourg	23,085	3	0,0%
Netherlands	167,995	3	0,2%
Norway	642,438	5	0,6%
Poland	6,955,662	18	6,8%
Portugal	452,265	33	0,4%
Romania	2,829,263	31	2,8%
Russia	47,260,401	179	46,2%
Serbia	963,228	3	0,9%
Slovakia	209,334	11	0,2%
Slovenia	262,959	2	0,3%
Spain	297,533	28	0,3%
Sweden	13,314,529	23	13,0%
Switzerland	578,361	3	0,6%
Ukraine	4,454,905	115	4,4%
United Kingdom	1,631,922	30	1,6%
TOTAL	102,273,225	765	100,0%

The Table 14 shows the distribution of the Global FSC Chain of Custody certificates in Europe by country (August 2019).

Table 14.- Global FSC Chain of Custody certificates in Europe by country (2019)

Country	No.	%
Albania	3	0,0%
Andorra	1	0,0%
Austria	300	1,5%
Belarus	207	1,1%
Belgium	284	1,5%
Bosnia and Herzegovina	305	1,6%
Bulgaria	469	2,4%
Croatia	283	1,5%
Cyprus	17	0,1%

Country	No.	%
Czech Republic	287	1,5%
Denmark	304	1,6%
Estonia	266	1,4%
Finland	140	0,7%
France	748	3,8%
Germany	2,243	11,5%
Greece	104	0,5%
Hungary	156	0,8%
Ireland	120	0,6%
Italy	2,471	12,7%
Kosovo	1	0,0%
Latvia	313	1,6%
Liechtenstein	4	0,0%
Lithuania	365	1,9%
Luxembourg	14	0,1%
Malta	13	0,1%
Moldova, Republic Of	3	0,0%
Monaco	6	0,0%
Netherlands	1,233	6,3%
North Macedonia Republic Of	15	0,1%
Norway	64	0,3%
Poland	1,996	10,3%
Portugal	314	1,6%
Romania	724	3,7%
Russia	608	3,1%
San Marino	5	0,0%
Serbia	194	1,0%
Slovakia	165	0,8%
Slovenia	238	1,2%
Spain	1,042	5,4%
Sweden	393	2,0%
Switzerland	443	2,3%
Ukraine	306	1,6%

Country	No.	%
United Kingdom	2,266	11,7%
Vatican City State	1	0,0%
TOTAL	19,434	100,0%

PEFC (Programme for the Endorsement of Forest Certification)[24]

The Programme for the Endorsement of Forest Certification (PEFC) is an international non-profit, non-governmental organization dedicated to promoting Sustainable Forest Management (SFM) through independent third-party certification.

It works throughout the entire forest supply chain to promote good practices in the forest and to ensure that timber and non-timber forest products are produced with respect for the highest ecological, social and ethical standards. Thanks to the eco-label, customers and consumers are able to identify products from sustainable managed forests.

With 43 endorsed national certification systems and over 300 million hectares of certified forests, PEFC is the world's largest forest certification system.

PEFC's Chain of Custody certification is a mechanism for tracking certified materials from the forest to the final product to ensure that the wood, wood fibre or non-wood contained in the product or product line can be traced back to certified forests.

Chain of Custody certification is carried out by accredited certification bodies that verify if the wood flow accounting system of a company complies with PEFC's International Chain of Custody Standard.

More than 20,000 companies and organizations are covered by PEFC Chain of Custody certification worldwide.

The following tables indicate the PEFC-certified forest area (Table 15) and Chain of Custody certificates per country (as of 31 Dec. 2018)[25] (Table 16).

Country	Total Area (ha)	%
Austria	2,669,187	2,5%
Belarus	8,595,160	7,9%
Belgium	300,999	0,3%
Czech Republic	1,736,924	1,6%
Denmark	274,325	0,3%
Estonia	1,241,612	1,1%
Finland	18,037,840	16,7%

[24] https://www.pefc.org/

[25] Source: Own elaboration based on the report “PEFC ANNUAL REVIEW 2018”

Country	Total Area (ha)	%
France	8,032,839	7,4%
Germany	7,571,509	7,0%
Italy	819,017	0,8%
Ireland	376,108	0,3%
Latvia	1,707,039	1,6%
Luxemburg	35,222	0,0%
Netherlands	3,240	0,0%
Norway	7,380,750	6,8%
Poland	7,155,810	6,6%
Portugal	268,824	0,2%
Russia Federation	20,694,095	19,1%
Slovakia	1,224,220	1,1%
Slovenia	286,000	0,3%
Spain	2,208,827	2,0%
Sweden	15,927,847	14,7%
Switzerland	240,386	0,2%
United Kingdom	1,475,365	1,4%
TOTAL	108,263,145	100,0%

Table 15.- PEFC certified forest area per country (2018)

Country	Certificates	%
Austria	454	4,9%
Belarus	104	1,1%
Belgium	270	2,9%
Bosnia & Herzegovina	2	0,0%
Bulgaria	6	0,1%
Croatia	7	0,1%
Cyprus	2	0,0%
Czech Republic	187	2,0%
Denmark	100	1,1%
Estonia	78	0,8%
Finland	234	2,5%
France	1,968	21,1%
Germany	1,695	18,2%
Greece	4	0,0%

Country	Certificates	%
Hungary	21	0,2%
Italy	719	7,7%
Ireland	38	0,4%
Latvia	80	0,9%
Lithuania	10	0,1%
Luxemburg	17	0,2%
Monaco	1	0,0%
Netherlands	468	5,0%
Norway	73	0,8%
Poland	183	2,0%
Portugal	152	1,6%
Romania	28	0,3%
Russia Federation	39	0,4%
Slovakia	116	1,2%
Slovenia	50	0,5%
Spain	888	9,5%
Sweden	195	2,1%
Switzerland	63	0,7%
Ukraine	1	0,0%
United Kingdom	1,057	11,4%
TOTAL	9,310	100,0%

Table 16.- PEFC Chain of custody certificates per country (2018)

4.6. GREEN BUILDING CERTIFICATION (BREEAM / LEED)

Buildings have extensive direct and indirect impacts on the environment during their life cycle (construction, occupancy, renovation, repurposing, and demolition), using energy, water, and raw materials, generate waste, and emit potentially harmful atmospheric emissions.

These facts have prompted the creation of green building standards, certifications, and rating systems aimed at mitigating the impact of buildings on the natural environment through sustainable design.

There are two main green building certification schemes: The Building Research Establishment's Environmental Assessment Method (BREEAM), which was the first green building rating system developed in the U.K, and the Leadership in Energy and Environmental Design (LEED) developed lately in the U.S. by the Green Building Council (USGBC).

There are other “green building certifications” but these two are the most extended.

The Building Research Establishment's Environmental Assessment Method (BREEAM)[26]

BREEAM is an international scheme that provides independent third-party certification of the assessment of the sustainability performance of individual buildings, communities and infrastructure projects.

It was the first building rating system to be established and it has been in use since 1990 throughout the UK, EU, EFTA member states, EU candidates, as well as the Persian Gulf.

BREEAM ratings are required for many governmental organizations throughout these countries and there are currently over 100,000 BREEAM-rated buildings.

Assessment and certification can take place at a number of stages in the built environment life cycle, from design and construction to operation and refurbishment. It requires a third-party certification by qualified and licensed BREEAM assessors.

Based on a common framework of technical standards, versions of BREEAM have been developed to assess all key elements of the built environment including:

- New Buildings
- Buildings that are in-use
- Buildings that are being refurbished and fitted out
- Infrastructure – civil engineering and public realm
- Communities – masterplanning
- New homes – Home Quality Mark (HQM)

The **BREEAM ratings range** from Acceptable (In-Use scheme only) to Pass, Good, Very Good, Excellent and Outstanding and it is reflected in a series of stars on the BREEAM certificate.

BREEAM measures sustainable value in a series of categories, ranging from energy to ecology. One of these categories is **"Materials",** which encourage steps taken to reduce the impact of construction materials through design, issues in this section focus on the procurement of materials that are sourced in a responsible way and have a low embodied impact over their life including extraction, processing and manufacture and recycling.

The Table 17[27] provides figures on the BREEAM Assessments that have been certified under BREEAM 2008 onwards in Europe- excepting a small number of buildings which cannot be listed for client confidentiality reasons.

Country	Number	%	Country	Number	%
Austria	46	0,2%	Luxemburg	127	0,6%
Belgium	404	2,1%	Malta	2	0,0%
Bulgaria	27	0,1%	Monaco	8	0,0%
Croatia	3	0,0%	Netherlands	1,351	6,9%
Czech Republic	174	0,9%	Norway	294	1,5%

[26] https://www.breeam.com

[27] Source: Own developed based on data from https://tools.breeam.com/projects/explore/buildings.jsp

Country	Number	%	Country	Number	%
Denmark	21	0,1%	Poland	701	3,6%
Estonia	3	0,0%	Portugal	36	0,2%
Finland	237	1,2%	Romania	169	0,9%
France	1,878	9,6%	Russia	120	0,6%
Germany	340	1,7%	Serbia	4	0,0%
Greece	15	0,1%	Slovakia	69	0,4%
Hungary	107	0,5%	Slovenia	2	0,0%
Iceland	10	0,1%	Spain	442	2,3%
Ireland	58	0,3%	Sweden	668	3,4%
Italy	185	0,9%	Switzerland	25	0,1%
Latvia	14	0,1%	Ukraine	4	0,0%
Lithuania	40	0,2%	United Kingdom	11,958	61,2%
			TOTAL	19,542	100,0%

Table 17.- BREEAM assessments certified in EU Countries

Leadership in Energy and Environmental Design (LEED)[28]

Leadership in Energy and Environmental Design (LEED)—was created in 2000 by the U.S. Green Building Council (USGBC), for rating design and construction practices that would define a green building in the United States. LEED is used throughout North America as well as in more than 30 countries with over 90,000 projects using LEED.

LEED consists of credits which earn points in 7 categories: Site Selection, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, Regional Priority, and Innovation in Design.

Since its inception, LEED standards have become more stringent as the market has changed and expanded to include distinct rating systems that address different building types: New Construction, Existing Buildings, Commercial Interiors, Core & Shell, Schools, Retail, Healthcare, Homes, and Neighbourhood Development.

The LEED certification process takes place at LEED Online. Project teams are required to compile documentation to show compliance with LEED requirements and upload this documentation to the LEED Online website. The documentation is then reviewed by the Green Building Certification Institute (GBCI); a LEED certification is earned if all prerequisites and a sufficient number of credits are earned. There are no on-site visits required and certification can occur upon completion of construction.

There are four levels of LEED certification: Certified (40-49 points earned), Silver (50-59 points earned), Gold (60-79 points earned), and Platinum (80+ points earned).

The Table 18[29] shows the number of LEED certified projects in Europe.

[28] https://new.usgbc.org/leed

[29] Source: Own development bassed on https://www.usgbc.org/projects

Country	Number	%	Country	Number	%
Austria	51	1,4%	Luxemburg	0	0,0%
Belgium	40	1,1%	Malta	7	0,2%
Bulgaria	39	1,0%	Monaco	0	0,0%
Croatia	7	0,2%	Netherlands	43	1,1%
Czech Republic	112	3,0%	Norway	9	0,2%
Denmark	34	0,9%	Poland	284	7,5%
Estonia	21	0,6%	Portugal	25	0,7%
Finland	270	7,2%	Romania	93	2,5%
France	125	3,3%	Russia	101	2,7%
Germany	563	14,9%	Serbia	38	1,0%
Greece	29	0,8%	Slovakia	36	1,0%
Hungary	86	2,3%	Slovenia	2	0,1%
Iceland	0	0,0%	Spain	623	16,5%
Ireland	130	3,5%	Sweden	351	9,3%
Italy	388	10,3%	Switzerland	66	1,8%
Latvia	3	0,1%	Ukraine	10	0,3%
Lithuania	12	0,3%	United Kingdom	168	4,5%
			TOTAL	3,766	100,0%

Table 18.- Number of LEED certified projects in EU countries

5. OTHER POLICIES AND STRATEGIES

5.1. CASCADING USE OF WOOD

Cascading use of biomass resources, such as wood and agricultural products, means an efficient use of these resources from the point of view of natural resources, materials and land consumption. Indeed, it is a principle to increase the productivity and efficient use of scarce and valuable raw material resources.

The cascading use principle gives priority to higher value uses that allow the reuse and recycling of products and raw materials. It promotes energy use only when other options are not feasible. It concretely prioritizes the material use of biomass than its use for producing energy, since burning implies that the raw material is lost. It also prioritizes energy production combined with 'co-products' such as compost or nutrients over energy productions only.

From the point of view of the circular economy, burning and incineration can be described as raw material leakage.

We need to highlight that the cascading use principle should not be limited to the recycling of raw materials. In line with the idea of the circular economy, maintenance and reuse of products needs to be encouraged also in the case of biobased products.

It's important also to note that the cascading use principle is only about the use of biomass resources and doesn't cover the environmental and biodiversity impacts of their production or the full greenhouse gas balance of the use of biomass for different purposes.

The Circular Economy package does not contain mandatory targets for recycling or separate collection of other wood fractions like post-consumer wood from households, construction and demolition wood and furniture. Instead, wood waste is governed by more generic measures like limits to the landfill of organic waste, which do not specifically address recovery of waste wood.

Solid wood use in furniture as a result of eco-design improvements combined with adequate collection and recovery operations could facilitate more cascading use by increasing availability of secondary wood material of suitable quality.

Equally important to enhance cascading use in furniture material is the development of loop solutions for wood-based boards that are the most frequently used wood component in furniture.

The European Commission has published two relevant publications on this issue:

- Vis M., U. Mantau, B. Allen (Eds.) (2016) Study on the optimised cascading use of wood. No 394/PP/ENT/RCH/14/7689. Final report. Brussels 2016. 337 pages. One of the analysed cases studies was the "Reuse and recycling of furniture wood", identifying barriers for the implementation of cascade use of wood.
- the "Guidance on cascading use of biomass with selected good practice examples on woody biomass" (2018). The publication proposes principles for cascading use of biomass in general, but it also takes a closer look at developments in the forest-based sector and illustrates these principles with examples from the sector.

5.2. EU INDUSTRY POLICY FOR FORESTRY

The EU has close to 182 million hectares of forests covering 43% of its land area and these forest areas are one of Europe's most important renewable resources. It accounts for approximately 5 % of the world's forests.

EU forests are exceptionally diverse, with a large variety of forest types, characteristics and ownership structures. They provide multiple benefits for society and the economy whilst being a major source of biodiversity. Additionally, they are a key resource for improving quality of life and in the creation of jobs.

This is the reason why The EU Commission adopted the EU Forest Strategy on the 20th of September 2013 (COM(2013) 659 final), which aims to help forests and the related sector to tackle current challenges. The Strategy provides a framework to respond to the increasing demands put on forests and to deal with societal and political changes that have affected forests during the last 15 years.

The EU forest strategy 2014-2020 was developed to provide a coherent framework for both EU forest-related policies and the national forestry policies of the individual EU countries. The strategy aims at promoting the concept of sustainable forest management, which aims to

safeguard and achieve the balanced development of the multiple functions of forests and efficiency use of resources.

The EU forest strategy focuses its attention on eight main priority areas

- supporting rural and urban communities
- fostering the competitiveness and sustainability of the EU's forest-based industries, bio-energy and the wider green economy
- protecting forests in a changing climate whilst promoting sustainable forestry management to mitigate climate change
- protecting forests and enhancing ecosystem services
- strengthening the knowledge of EU about forests and how they are changing
- developing new and innovative forestry and added-value products
- working together to coherently manage and better understand forests
- focusing on forests from a global perspective, including the conservation of non-EU forests.

The multi-annual implementation plan (Forest MAP.- SWD(2015) 164 final) of the EU forest strategy provides a concrete list of measures to ensure a coherent approach to the forests and forest-based sector, running from 2015 to 2020. It specifies those involved and the required timescale for the different measures. Additionally, it sets out the expected outcomes of these measures.

The strategy also calls for strengthening the forest knowledge base to better understand the complex environmental and societal challenges that the forest sector faces. This has been implemented though The Forest Information System for Europe (FISE),[30] which is the hub for data and information on forests and forestry in Europe. It provides information on the multifunctional role of forests and forest resources from diverse data sources, including JRC datasets and quantitative indicators collected in the context of Forest Europe.

In 2018, the Commission delivered the report "Progress in the implementation of EU forest strategy" (COM(2018) 811 final) reviewing this strategy. The review highlights that the EU forest strategy is achieving its objective to foster a more sustainable forest management at EU and global level.

The report has shown that EU efforts to reduce illegal logging globally, under the Forest Law Enforcement, Governance and Trade Action Plan, have been substantially more effective in 2015-2017, due partially to the increased cooperation and coordination promoted by the Forest Strategy, both within Europe and in international organisations.

Also, it proposes a new approach, "going out of the forest", dealing with aspects of its value chain, i.e. the methods through which forest resources are utilized to produce goods and services, which strongly affect forest management.

This strategy highlights the need of a holistic approach, taking into consideration that other policies have impacts on forests, and that it should be taken into account also other developments happening beyond forest boundaries. When designing their national forest policies, EU countries should take into consideration all forest-linked EU policies.

[30] https://data.jrc.ec.europa.eu/collection/FISE

5.3. THE FOREST BASED INDUSTRIES BLUEPRINT

In 2013, the European Commission published the Blueprint for the EU forest-based industries (SWD(2013) 343 final). This document accompanied the EU Forest strategy and it highlights the challenges that the forest-based industry has to address to remain competitive. The challenges can be summarised as follow:

- Stimulating growth for forest-based products in EU and non-EU markets.
- Resource and energy efficiency – in addition to innovation and securing their productivity, the EU Forest-based Industries should focus on using resources and energy in the most efficient manners to compensate their globally high production costs.
- Raw materials - a quarter of EU forests face legal and owners' limitations making more fresh wood purchasing increasingly difficult and costly. At the same time, EU is facing an increasing export of sawlogs toward global competitors and the payment of increasing other countries custom duties when importing wood.
- Better logistics are needed for raw material supply and product delivery.
- Structural adaptation the industry, composed of many micro companies, small and medium-sized enterprises (SMEs), to perform better and more efficiently need to create stronger cooperation across their value chains.
- Innovation and RTD - new products are needed to meet changing societal demands. Only new processes and business models can help this, such as bio-refineries.
- Education and skills, the ageing workforce - without re-training the workforce, technological improvements cannot be achieved. A shortage of young entrants into the industry means that existing skills are not being passed on from an ageing workforce.
- Coherence of EU legislation – to facilitate a foreseeable environment for companies, it is important to ensure EU legislation coherence and consistency.
- Implementing EU Climate Policy after 2030 – considering the increasing greenhouse gas savings targets and renewable energy targets, demand for wood biomass will probably increase and wood-based products will need to be able to demonstrate their carbon storage potential.
- International competition, trade, and cooperation - in a global economy, low-cost producers competitors of wood-based products will increasingly penetrate EU markets. Increasingly sophisticated, higher-value wood-based products can represent a competitive advantage in EU and non-EU markets. Cooperation can support this.
- Information, communications, and image - better information and communication of Forest-based Industries are crucial both within and with other sectors. Based on this, a better image of the sector could be projected.

Some actions have been identified to address these challenges for the timeframe 2014-2020. The ongoing actions include:

- Examining the opportunity of improving information on furniture products.
- Conducting a cumulative cost assessment of EU legislation and policies affecting the sector.

- Improving the understanding of the cascading use of wood, identification of barriers to its functioning, and good practices and measures to overcome them.
- Facilitating the increased sustainable wood mobilisation.

In November 2019, the Confederation of European Paper Industries (CEPI), the European Confederation of Woodworking Industries (CEI-Bois), the European Panel Federation (EPF), the European Furniture Industries Confederation (EFIC), Bioenergy Europe and the Forest based Sector Technology Platform (FTP) presented a document on how the European Forest-based Industries can contribute to the 2050 climate neutrality target. This vision is supported also by other organisations related to forest-based industries.

In order to turn this vision into reality, the Forest-based Industries have identified 5 ambitious goals:

1. Help decarbonise Europe 2050 by replacing critical or CO2-intensive raw materials and fossil energy with forest-based alternatives
2. Eradicate waste in the circular economy by closing material loops with a sector target of at least 90% material collection and 70% recycling rate
3. Drive resource-efficiency in the FBI industrial value chain by enhancing productivity in all areas (including materials, manufacturing and logistics)
4. Meet the increasing demand for raw materials by maximising new secondary streams and ensuring primary raw material supply from sustainably managed forests
5. Satisfy the growing demand for climate-friendly products by increasing the use of wood and wood-based products in our daily lives

In order to meet these five strategic goals, Forest-based Industries have identified three pathways that will drive the shift to a low carbon circular bioeconomy, identifying the challenges and Solution Areas for each of them:

1. Develop markets
2. Ensure sustainable supply of raw materials and
3. Boost innovation

Cross cutting partnerships are also identified to enhance data availability, secure skills and strengthen the sector's attractiveness.

5.4.BIOECONOMY

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. It includes and interlinks: land and marine ecosystems and the services they provide; all primary production sectors that use and produce biological resources (agriculture, forestry, fisheries and aquaculture); and all economic and industrial sectors that use biological resources and processes to produce food, feed, bio-based products, energy and services (except biomedicines and health biotechnology).

The goal is a more innovative and low-emissions economy, integrating demands for sustainable agriculture and fisheries, food security, and the sustainable use of renewable biological resources for industrial purposes, while ensuring biodiversity and environmental protection.

To achieve this, the European Commission has set a Bioeconomy Strategy and action plan which focuses on three key aspects:

- developing new technologies and processes for the bioeconomy;
- developing markets and competitiveness in bioeconomy sectors;
- pushing policymakers and stakeholders to work more closely together.

This strategy was published in 2012 and revised in 2018. This update designed an action plan including 14 concrete actions to be launched in 2019, and based on three key priorities:

- strengthen and scale up the bio-based sectors, unlock investments and markets;
- deploy local bioeconomies rapidly across the whole Europe;
- understand the ecological boundaries of the bioeconomy.

Moreover, the Commission works on ensuring a coherent approach to the bioeconomy through different programmes and instruments including the Common Agricultural Policy, the Common Fisheries Policy, Horizon 2020, BBI, European environmental initiatives, the Blue Growth initiative for the marine sector and the European Innovation Partnership on Sustainable Agriculture[31].

[31] https://ec.europa.eu/research/bioeconomy/index.cfm?pg=home

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Annex 1.- Status of the actions in the Circular Economy Action Plan

The relevance of the actions for the Wood-based Furniture Sector is classified according the following colour codes:

⇧ Relevant; ⇗ Possibly relevant in the future; ⇔ Not relevant

N°	Actions	Timetable	Delivered	Rel.
			PRODUCTION	
1	Emphasis on circular economy aspects in future product requirements under the Ecodesign directive	2016 onwards	Product requirements related to circular economy (i.e. durability, recyclability, reusability and Critical Raw Material declaration) have been included in most eco-design regulations foreseen for adoption in 2019 in accordance with to the Ecodesign work plan, such as on enterprise servers, welding equipment, electronic displays, washing machines, dishwashers and refrigerators.	⇗
2	Ecodesign work plan 2015-2017 and request to European standardisation organisations to develop standards on material efficiency for setting future Ecodesign requirements on durability, reparability and recyclability of products	Dec 2015	The Commission adopted the Ecodesign Working Plan 2016-2019 (COM(2016) 773 final). A set of revised Ecodesign and Energy labelling measures will be adopted in the first half of 2019. Mandate 543 of the Commission to 3 European Standardisation Organisations, aiming at the development of standards on material efficiency aspects.	⇗
3	Proposal for an Ecodesign implementing regulation on televisions and displays	End 2015 or beginning 2016	The package of measures will be adopted in 2019 first half. The new measure on electronic displays introduces new eco-design requirements for televisions, widening the scope of the measure to other displays (e.g. computer monitors). The new measure further contains material efficiency requirements.	⇔
4	Examine options and actions for a more coherent policy framework of the different strands of work of EU product policy in their contribution to the circular economy	2018	The Staff Working Document on Sustainable Products in a Circular Economy {SWD(2019) 91} examines the EU product policy framework. It identifies high priority products for circularity and analyses to what extent the relevant EU policies are mutually reinforcing and supporting circular economy.	⇧
5	Include guidance on circular economy into Best Available Techniques reference documents (BREFs) for several industrial sectors	2016 onwards	Since 2015, Best Available Techniques reference documents including guidance on circular economy have been adopted for: • Non-ferrous metals • Common Waste Water and Waste Gas Treatment / Management Systems in the Chemical Sector • Intensive Rearing of Poultry and Pigs	⇗

N°	Actions	Timetable	Delivered	Rel.
			• Large Volume Organic Chemicals • Large Combustion Plants	
6	Guidance and promotion of best practices in the mining waste management plans	2018	The Commission services have published the document: Development of a guidance document on best practices in the Extractive Waste Management Plans. Circular Economy (ISBN 978-92-76-00037-2.- January 2019)	⇗
7	Establishing an open, pan-European network of technological infrastructures for SMEs to integrate advanced manufacturing technologies into their production processes	2016	The EU funded project Ket4CleanProduction has established a platform that gathers technology infrastructures. The platform grants access to a network of experts that can provide support for the transition to a Factory of the Future (https://www.ket4sme.eu)	⇧
8	Examine how to improve the efficiency and uptake of the EU Eco-Management and Audit Scheme (EMAS) and the pilot programme on Environmental Technology Verification (ETV)	2017	The Commission published a report on the review of implementation of EMAS regulation in June 2017 (COM(2017) 355 final). It evaluates the performance of EMAS, in particular its relevance, effectiveness, efficiency, coherence and EU added value. The Commission has obtained the commitment of Member States to work for increasing the uptake of the scheme. The results of the evaluation of the ETV pilot programme and the conclusions on the way forward are scheduled to be presented in the second quarter of 2019.	⇧
9	Develop an improved knowledge base and support to SMEs for the substitution of hazardous substances of very high concern	2018	Two actions have been put forward: • COSME Project to facilitate and disseminate best practices on the substitution of certain chemicals substances in specific areas • Support of the European Resource Efficiency Excellence Centre	⇧
CONSUMPTION				
10	Better enforcement of existing guarantees on tangible products, accompanied by a reflection on improvements (upcoming Commission proposal for online sales of goods, and Fitness Check of consumer legislation)	2015-2017	The proposal for a Directive on the online sales of goods, presented in December 2015 was amended in 2017 to extend its scope to also cover sales of goods offline. A provisional agreement was reached by the co-legislators on 29 January 2019. The Fitness Check of the Consumer and Marketing Law was finalised in May 2017. The Consumer Protection Cooperation (CPC) Regulation was revised in December 2017 and will be applicable from 17 January 2020 (Regulation (EU) 2017/2394) The 'New Deal for Consumers' package was adopted by the Commission on 11 April 2018 (COM(2018) 183 final).	⇧

N°	Actions	Timetable	Delivered	Rel.
11	Action on false green claims, including updated guidance on unfair commercial practices	2016	Updated guidance on the Unfair Commercial Practices Directive, which was published in May 2016 (SWD(2016) 163 final)..	⇧
12	Analysis of the possibility to propose horizontal requirements on repair information provision in the context of Ecodesign	2018	A reparability scoring system has been published in March 2019 by the Joint Research Center (JRC). JRC study on behavioural study on consumer's engagement in the circular economy, finalised in October 2018 The Commission is developing a scoring system on product reparability.	⇧
13	REFIT of Ecolabel, to be followed by actions to enhance its effectiveness	2016	The EU Ecolabel fitness check was done in June 2017 (COM(2017) 355 final). The EU Ecolabel catalogue has been improved. Since December 2018, a 38% of more products and services are awarded than in 2015. Criteria for financial products are nowadays under development.	⇧
14	Assessment of the possibility of an independent testing programme on planned obsolescence	2018	In October 2017, the Commission launched a call for an independent testing programme under H2020 to identify factors that cause premature obsolescence practices and way to address them. The project is expected to start in June 2019, with duration of four years.	⇗
15	Subject to evaluation of the current ongoing pilots, explore the possible uses of the Product Environmental Footprint to measure and communicate environmental information	2016 onwards	Between 2013 and 2018, the Commission tested the application of the Product and Organisation Environmental Footprint methods on specific product groups and sectors. Furthermore, it tested approaches to verifying and communicating the resulting information. The results of the pilot phase are now available on the website http://ec.europa.eu/environment/eussd/smgp/PEFCR_OEFSR_en.htm	⇗
16	Action on Green Public Procurement: enhanced integration of circular economy requirements, support to higher uptake including through training schemes, reinforcing its use in Commission procurement and EU funds	2016 onwards	New/revised EU green public procurement criteria integrating circular economy requirements published since December 2015 includes computers and monitors, textiles, furniture, indoor cleaning services, paints and varnishes, road design, construction and maintenance, office building design, construction and maintenance. The Commission published the 3rd edition of the "Buying green" handbook and the brochure "Public Procurement for a Circular Economy". The Monitoring framework for circular economy adopted in 2018 includes an indicator on Green Public Procurement.	⇧
			WASTE MANAGEMENT	
17	Revised legislative proposal on waste	Dec 2015	The revised legislation was adopted on 30 May 2018 and entered into force on 4 July 2018 (Directive (EU) 2018/851). The outcome of the review added further ambition, in particular to ensure the application of circular economy principles to waste management.	⇧

N°	Actions	Timetable	Delivered	Rel.
18	Improved cooperation with Member States for better implementation of EU waste legislation, and combat illicit shipment of end of life vehicles	2015 onwards	• Support to Member States authorities trough networks such as IMPEL, • Exchange of good practices on Member States campaigns for inspection of ELV treatment facilities, • Reinforced exchange of information regarding certificates of destructions (CoDs) • On-going review of the End-of-Life Vehicles Directive, including aspects on shipment of waste vehicles	⇔
19	Stepping up enforcement of revised Waste Shipment regulation	2016 onwards	• Preliminary correlation table between customs and waste codes, which will help customs officials to identify more easily potential waste streams. (Implementing act C/2016/4780 • Exploring the preparation of a set of guidelines to facilitate the interchange of electronic data. • On-going evaluation of the inspection requirements (expected by May 2019).	⇗
20	Promotion of industry-led voluntary certification of treatment facilities for key waste/recyclate streams	2018 onwards	The promotion of voluntary schemes has been supported with targeted funding from Horizon 2020. For example, the CEWASTE H2020 project aims at understanding existing recovery practices, standards and verification schemes; developing sustainability and traceability requirements and assurance system and related verification procedures (https://cewaste.eu/)	⇧
21	Initiative on waste to energy in the framework of the Energy Union	2016	The Communication of the Commission titled "The role of waste-to-energy in the circular economy", adopted on 26 January 2017 (COM(2017) 34 final), has the aim to get more energy from less waste, providing guidance to Member States and identifying promising technologies and processes	⇧
22	Identification and dissemination of good practices in waste collection systems	2016 onwards	Guidelines on the implementation of separate collection obligations and best practices, in particular focusing on key waste streams, such as plastics, bio-waste and textiles are to be adopted by the end of 2019. Studies on separate collection, for example: “Assessment of separate collection schemes in the 28 capitals of the EU” (November 2015) p the Horizon2020 project ImpactPapeRec (http://impactpaperec.eu/en)	⇧
MARKET FOR SECONDARY RAW MATERIALS				
23	Development of quality standards for secondary raw materials (in particular for plastics)	2016 onwards	Report of the European Committee for Standardisation (CEN) on a comprehensive mapping exercise of existing or ongoing standardisation work related to the treatment of waste and the quality of secondary raw materials, in particular for plastics. It includes work by industry and other organisations in this area at national, European and international level. It was	⇗

N°	Actions	Timetable	Delivered	Rel.
			delivered in June 2018. Specific studies are currently focusing on the development of standards for sustainable chemicals and for secondary raw materials.	
24	Proposal for a revised fertilisers regulation	Early 2016	Political agreement on a new Regulation on fertilisers reached by the European Parliament and the Council on 12 December 2018 (press release IP/18/6161). The new Regulation, among others, grants a level playing field to organic fertilising products that would now have the CE marking. As such, the Fertilising Products Regulation boosts the European market for innovative organic fertilisers manufactured from by-products and recovered bio-waste.	⇗
25	Proposed legislation setting minimum requirements for reused water for irrigation and groundwater recharge	2017	Proposal for a Regulation on minimum requirements for water reuse (COM/2018/337 final - 2018/0169 (COD)), adopted on 28 May 2018 The proposed legislation sets minimum requirements for reused water for agricultural irrigation and it aims at encouraging the safe, efficient and cost-effective reuse of treated urban wastewater. The objective is to turn a wasted resource into a valuable one for further use and addressing water scarcity.	⇔
26	Promotion of safe and cost-effective water reuse, including guidance on the integration of water reuse in water planning and management, inclusion of best practices in relevant BREFs, and support to innovation (through the European Innovation Partnership and Horizon 2020) and investments	2016-2017	In July 2016, the Commission issued Guidelines on Integrating Water Reuse and Water Planning and Management in the context of the Water Framework Directive. These guidelines encourage Member States to systematically consider water reuse when implementing the EU water legislation. Water saving, reuse and recycling is also considered in the development and review of BREFs for relevant (agro)industrial sectors under the scope of the Industrial Emissions Directive. Water reuse was made a top priority area in the European Innovation Partnership (EIP) on Water. Dedicated funding is available in European Regional Development Fund (ERDF), H2020, and LIFE. Support for water reuse infrastructure is made available by the ERDF, the Cohesion Fund and European Agricultural Fund for Rural Development (EARDF).	⇗
27	Analysis and policy options to address the interface between chemicals, products and waste legislation, including how to reduce the presence and improve the tracking of chemicals of concern in products	2017	Commission Communication on options to address the interface between chemicals, product and waste legislations (COM(2018) 32 final), adopted on 16 January 2018, and accompanying staff-working document (SWD(2018) 20 final). In these documents the Communication explores the four most critical issues identified in the way the legislation on chemicals, products and waste work together and how these are hampering a circular economy development (i.e. information to those who handle waste and prepare it for recovery; substances in waste not allowed in new products; not fully harmonisation of EU's rules on end-of-waste and rules on hazardous wastes and chemicals). After a 12-week public consultation, the Commission Services are now preparing a summary report of the results of the public consultation.	⇧

N°	Actions	Timetable	Delivered	Rel.
28	Measures to facilitate waste shipment across the EU, including electronic data exchange (and possibly other measures)	2016 onwards	In 2020 the Commission will review the Waste Shipment Regulation to assess whether the regulation meets its objectives and is coherent with the general objectives of EU environmental policy, CE and the internal market. Preparatory work for the review includes consultations and workshops with stakeholders. In view to prepare guidelines, a working group of Member States and stakeholders' representatives is addressing issues related to electronic data interchange.	⇔
29	Further development of the EU raw materials information system	2016 onwards	A series of actions have been started to improve information on raw materials: • the Raw Materials Information System (RMIS) launched by JRC in November 2017 (http://rmis.jrc.ec.europa.eu) • the Raw Materials Scoreboard of indicators (https://publications.europa.eu/en/publication-detail/-/publication/117c8d9b-e3d3-11e8-b690-01aa75ed71a) • and several Horizon 2020 projects. The new RMIS includes 12 thematic blocks covering the most relevant aspects/topics related to the raw materials sectors, including critical raw materials; raw materials monitoring frameworks; circular economy and secondary raw materials; environmental and social sustainability; economics & trade; industry & innovation; country & raw material profiles.	⇗
			SECTORIAL ACTION	
			Plastics	
30	Strategy on plastics in the circular economy	2017	The EU Strategy for Plastics in a Circular Economy (COM(2018) 28 final) and a Staff Working Document (SWD(2018) 16 final) were published on 16 January 2018 in the context of the Circular Economy Package, along with a report on oxo-degradable plastics.(COM(2018) 35 final). As part of the implementation of the actions to address marine litter, the Commission proposed in May 2018 new EU-wide rules to target the 10 single-use plastic items most often found on Europe's beaches and seas, as well as lost and abandoned fishing gear. Co-legislators found an agreement on this proposal on 19 December 2018. Agreement was also found in December 2018 on the proposed new rules on port reception facilities for the delivery of waste from ships, which should ensure that the waste is delivered to adequate facilities on shore, instead of being discharged at sea. The Commission also organised a pledging campaign, calling industrial stakeholders to make voluntary pledges to boost the uptake of recycled plastics in products put on the EU	⇗

N°	Actions	Timetable	Delivered	Rel.
			market. 70 pledges were received. The recently established Circular Plastics Alliance will facilitate the achievement of this strategy. The Commission has also submitted a file to ECHA in order to seek restrictions for microplastics intentionally added to products.	
31	Specific action to reduce marine litter implementing the 2030 Sustainable Development Goals	2015 onwards	On 20 June 2018, the Commission and UN Environment agreed to the 2018 Oceans Roadmap 2 addressing in particular threats of pollution and marine litter, in line with international commitments and the implementation of ocean related SDGs. Programmes of measures under the Marine Strategy Framework Directive (MSFD) were submitted in 2016 by MS for reaching good environmental status by 2020. A series of projects and initiatives under FP7 and H2020 address marine litter, the ecological aspects of microplastics and bio-based solutions. 14 Member States committed resources for the collection of lost fishing gear and marine litter in their respective Operational Programmes for the European Maritime and Fisheries Fund (EMFF).	⇔
FOOD WASTE				
32	Development of a common methodology and indicators to measure food waste	2016	The Commission is elaborating a harmonised methodology to measure food waste at each stage of the food supply chain. The EU Platform on Food Losses and Food Waste contributed to key concepts underlying the methodology for measuring and monitoring food waste (https://ec.europa.eu/food/safety/food_waste/eu_actions/eu-platform_en). Delegated Decision C(2019) 3211 final as regards a common methodology and minimum quality requirements for the uniform measurement of levels of food waste. Food waste is also included in the Monitoring Framework of indicators for Circular Economy.	⇔
33	Stakeholders platform to examine how to achieve SDGs goals on food waste, share best practice and evaluate progress	2016	The previously mentioned EU Platform on Food Losses and Food Waste, bringing together international organisations, Member States and stakeholders, supports all key players in taking effective measures to prevent and reduce food loss and waste, facilitate inter-sector cooperation, define good practice and share results achieved. A digital network was also set up in 2017 to improve collaboration and exchange amongst Platform members. The Platform has partnered with Horizon 2020 project REFRESH to establish a community of experts on food waste prevention allowing engagement with a broader stakeholder network.	⇔

N°	Actions	Timetable	Delivered	Rel.
34	Clarify relevant EU legislation related to waste, food and feed in order to facilitate food donation and utilisation of former foodstuffs for animal feed	2016	The Commission published EU Guidelines for the feed use of food no longer intended for human consumption (C/2018/2035). With support of the EU Platform on Food Losses and Food Waste, the Commission adopted EU guidelines on food donation in October 2017 (C(2017) 6872 final). The Platform is expected to adopt, early 2019, a document illustrating Member States food donation practices and the European Commission has launched an EU pilot project on food redistribution (2018-2020) will further explore the policy, regulatory and operational frameworks existing in the Member States as well as promote dissemination of the EU food donation guidelines and stakeholder engagement in this regard.	⇔
35	Explore options for more effective use and understanding of date marking on food	2017	In February 2018, the European Commission published a market study on date marking practices in the EU, thus increasing the understanding of date marking and its effects on food waste generation. Technical guidance is currently under preparation, with support of the EU Platform on Food Losses and Food Waste, in order to promote more consistent date marking practices in line with EU date marking rules.	⇔
			CRITICAL RAW MATERIALS	
36	Report on critical raw materials and the circular economy	2017	The report on critical raw materials was published on 16 January 2018. The report provides key data sources and, looking at eight sectors (i.e. mining, landfills, electric and electronic equipment, batteries, automotive sector, renewable energy, defence industry and chemicals & fertilisers), promotes best practices and identifies actions to improve recycling.	⇗
37	Improve exchange of information between manufacturers and recyclers on electronic products	2016 onwards	The Directive on waste electrical and electronic equipment (WEEE Directive) requires that producers of such equipment provide information free of charge about preparation for re-use and treatment in respect of new equipment placed for the first time on the Union market. The "i4R" platform (http://www.i4r-platform.eu) was launched to allow the exchange of information between producers of electrical and electronic equipment and recyclers of WEEE.	⇔
38	European standards for material-efficient recycling of electronic waste, waste batteries and other relevant complex end-of-life products	2016 onwards	A first series of standards has been developed by CENELC in support of the WEEE Directive, covering all product categories and addressing the collection, transport and treatment, including preparation for reuse of the WEEE (e.g. EN 50614 Preparing for re-use). The Commission requested the European Standardisation Organisations to further develop European standards for material-efficient recycling of electronic waste and waste batteries with the objective of increasing high-quality recycling of Critical Raw Materials.	⇗

N°	Actions	Timetable	Delivered	Rel.
39	Sharing of best practice for the recovery of critical raw materials from mining waste and landfills	2017	With regard to mining waste, it was published in 2017 the review of the state of implementation of the Extractive Waste Directive by Member States. In addition, the Commission's Joint Research Centre published in May 2019 a report gathering best practices on non-critical and critical raw material recovery from mining waste and landfills, as a supporting action for Extractive Waste Management Plans. Furthermore, two Horizon 2020 projects are completing a secondary raw materials inventory as regards mining waste and landfills.	⇔
CONSTRUCTION AND DEMOLITION				
40	Pre-demolition assessment guidelines for the construction sector	2017	The outcomes of the study on Pre-demolition & Renovation Waste Audits were released as Guidelines for Assessment of Construction and Demolition Waste Streams prior to the Demolition or Renovation of Buildings and Infrastructures60 (known as Waste Audit Guidelines). A waste audit is a specific task necessary to understand the type and amount of elements and materials that will be deconstructed/ demolished and to issue recommendations on their further handling.	⇔
41	Voluntary industry-wide recycling protocol for construction and demolition waste	2016	The EU Construction and Demolition waste management protocol was published in October 2016. Dissemination and communication actions on the protocol have been implemented in order to assist Member States, regional, local authorities and private practitioners in adopting it in their construction market. In 2017, in parallel to the Pre-demolition assessment guidelines a communication campaign was performed with participation to several conferences and congresses and roadshow events in 6 EU capitals.	⇔
42	Core indicators for the assessment of the lifecycle environmental performance of a building, and incentives for their use	2017 onwards	Level(s) is the European reporting framework for sustainable buildings. It is a voluntary reporting framework to improve the sustainability of buildings. Using existing standards, Level(s) provides a common EU approach to the assessment of environmental performance in the built environment. It includes both resource use indicators and indicators linked to the quality and the value of buildings. Together they provide a common language for communicating on environmental performance to the mainstream market. The test phase, dedicated to test the usefulness and robustness of the different parts of the framework, is now ongoing. Level(s) is being tested in more than 130 building projects in 21 countries. A public consultation is foreseen early 2020.	⇔
BIOMASS AND BIO-BASED MATERIALS				
43	Guidance and dissemination of best practice on the cascading use of biomass and support to innovation in this domain through Horizon 2020	2018- 2019	Guidance on cascading use of biomass was published on November 2018 to promote efficient use of bio-based resources through dissemination of best practices and support for innovation in the bio-economy. The guidance explains cascading and provides some principles and practices to inspire stakeholders when applying it.	⇧

N°	Actions	Timetable	Delivered	Rel.
44	Ensuring coherence and synergies with the circular economy when examining the sustainability of bioenergy under the Energy Union	2016	The Renewable Energy Directive (Directive (EU) 2018/2001) contains provisions referring to circular economy and waste hierarchy. These address the risk of conflicting use of biomass resources between energy and non-energy sectors and of creating financial incentives that would undermine the separate collection obligations set out in the Waste Framework Directive.	⇧
45	Assessment of the contribution of the 2012 Bioeconomy Strategy to the circular economy and possible review	2016	The updated Bioeconomy Strategy and Action plan propose 14 concrete actions along three priority areas: • strengthen and scale-up the bio-based sectors, unlock investments and markets, • deploy rapidly bioeconomies across the whole of Europe, • understand the ecological boundaries of the bioeconomy. The promotion of bio-based materials and products, whenever possible and relevant, will be ensured during the development of EU Ecolabel and GPP criteria for new or existing product groups, according to Environmental Footprint results, and in line with available EU standards and technical reports, as well as with the strategic approach for EU Ecolabel and GPP.	⇧
	INNOVATION AND INVESTMENTS			
46	Initiative "Industry 2020 and the circular economy" under Horizon 2020	October 2015	Two "focus areas" have been dedicated to the circular economy in the Work Programmes 2016-17 and 2018-20 of Horizon 2020, covering call topics specifically developed to address the needs related to a circular economy in a systematic and comprehensive way. The total investment is 900 M€ in 2016-17, in focus area "Industry 2020 and the circular economy", of which 320M€ is exclusively for the circular economy; and around 950M€ are expected for the period 2018-20, in focus area "Connecting economic and environmental gains - the Circular Economy (CE)". In particular, a 200M€ crosscutting call on “competitive, low-carbon and circular industries” has been designed for the 2020 Work Programme. The Commission has published a Report of the projects relevant to the circular economy funded under H2020 between 2016 and 2018.	⇧
47	Pilot project for "innovation deals" to address possible regulatory obstacles for innovators	2016	The first call for pilot projects received 32 proposals from 14 different countries. The two selected Innovation Deals focus on: (1) sustainable wastewater treatment and (2) optimising e-vehicle battery usage. Work on the two Innovation Deals is ongoing. An evaluation of the pilot will take place in 2019.	⇔
48	Targeted outreach to encourage applications for funding under EFSI, and support the development of projects and investment platforms relevant to the	2016 onwards	Awareness raising and thematic workshops started in 2016 and continue in 2019 to increase the use of funds for the circular economy through EFSI with a focus on green investments for environment and resource efficiency projects (including energy efficiency and renewable energy projects). To provide advice on funding opportunities, it was launched the European	⇧

N°	Actions	Timetable	Delivered	Rel.
	circular economy		Investment Advisory Hub (EIAH), while EUR 100 million are made available via the Circular Bioeconomy Thematic Investment Platform.	
49	Targeted outreach and communication activities to assist Member States and regions for the uptake of Cohesion Policy funds for the circular economy	2016 onwards	From 2014 to 2020, cohesion policy allocates around EUR 150 billion to objectives with a direct relevance to the circular economy, such as research and innovation, SMEs, low-carbon economy, resource efficiency and waste management. The implementation of the national and regional programmes is now fully underway and projects are being selected by the Member States. The Commission offers various mechanisms to help Member States implement the programmes and carry out projects in order to use the available resources in an optimal way. There are several programmes fostering interregional cooperation on circular economy activities. The allocations and expected results are visualised in the new Open Data Platform. Circular economy was chosen as one of the categories for the RegioStars Awards in 2016, which exemplify outstanding EU funded regional development projects.	⇧
50	Support to Member States and regions to strengthen innovation for the circular economy through smart specialisation	2016 onwards	About EUR 41 billion are available to implement the so-called smart specialisation strategies of regions and Member States. In these strategies, several regions have selected priorities related to the circular economy. The Smart Specialisation Platform and the thematic platforms on energy, agri-food, and industrial modernisation hosted by the JRC help the implementation of those strategies. In 2018, pilot actions have been launched to further support innovation projects proposed by interregional partnerships to strengthen commercialisation and scale-up activities and foster investments. Several of those actions are pertinent to circular economy, such as deç/ re-manufacturing for circular economy, 3D printing and bio-economy.	⇧
51	Assessment of the possibility of launching a platform together with the EIB and national banks to support the financing of the circular economy	2016	The Circular Economy Finance Support Platform was launched on 26 January 2017. The Platform aims to increase awareness of the circular economy business logic and improve the uptake of circular economy projects by investors. A Commission expert group (E03517) was set-up to coordinate activities regarding the financing of the circular economy and to develop general recommendations on structuring and improving the bankability of circular economy projects. A report titled “Accelerating the transition to the circular economy – Improving access to finance for circular economy projects” was published in March 2019.	⇧
52	Engagement with stakeholders in the implementation of this action plan through existing fora in key sectors	2016 onwards	The European Circular Economy Stakeholder Platform (https://circulareconomy.europa.eu/platform/) was launched in March 2017 to foster policy dialogue, to exchange expertise among stakeholders and to identify barriers in relation to the circular economy. This website includes good practices, national, regional, local strategies, studies and report and voluntary commitments, etc. A Coordination Group composed of representative from existing networks working on circular economy was set up to multiply the impact of the platform. The implementation of the action plan has also been	⇧

N°	Actions	Timetable	Delivered	Rel.
			supported with specific communication activities carried out in all Member States.	
53	Support to a range of stakeholders through actions on public-private partnerships, cooperation platforms, support to voluntary business approaches, and exchanges of best practices	2015 onwards	A Smart Specialisation Platform on Industrial Modernisation has been launched in June 2016 to facilitate cross-regional cooperation towards industrial modernisation projects, e.g. on resource efficiency, remanufacturing/sustainable manufacturing. In 2018 the Pilot Project 'Boosting the circular economy amongst SMEs in Europe' provided online training to SME support organisations and policy advice to regional authorities. It also helped companies which offer highly promising green solutions for a circular economy to scale-up their solutions across Europe. In addition, the European Resource Efficiency Knowledge Centre was also set up (https://www.resourceefficient.eu). In 2017, a partnership on Circular Economy within the Urban Agenda for the EU was launched, to identify innovative, feasible solutions for making European cities transition to a circular economy. In support of the partnership, the Commission awarded projects for Urban Innovative Actions on circular economy to 8 cities in October 2017. This initiative aims to provide urban areas throughout Europe with new resources to test new and unproven solutions to address the challenges of the circular economy. The transition towards a circular economy has also been promoted either through events organised by the Commission's Representations, through corporate communication campaigns, or through Citizens' Dialogues.	⇧
			MONITORING	
54	Development of a monitoring framework for the circular economy	2017	A Monitoring Framework of Indicators for the Circular Economy was published on 16 January 2018. The framework helps to measure progress towards a circular economy at EU and national level. It is composed of a set of ten key indicators which cover each phase as well as economic aspects. Consistency with the monitoring of other measureable trends such as the progress on the implementation of 2030 Agenda is ensured by establishing common indicators .The indicators and underlying data are publicly available on a dedicated EUROSTAT website (https://ec.europa.eu/eurostat/web/circular-economy/indicators/monitoring-framework) .	⇗