



# Mapping existing Circular Economy Learning Resources in Furniture

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Nº 1

**Introduction**

Task 2.1 deals with creating a database of existing training materials / learning units and resources in the field of three specific topics: circular economy, industry 4.0 and active and assisted living.

Considerable amount of learning units has already been completed and are available for free use on different platforms. These projects are EU-funded and have been developed with the help of individual members of the ALLVIEW project team in the past years. These include projects such as FURN360, ECOSIGN, DITRAMA and IN4WOOD.

Considering previous work of the consortium partners (CETEM, AMUEBLA and KIT) project FURN360 is especially focused for the topic of circular economy. In this EU-funded project (Project reference: 2017-1-BE01-KA202-024752, duration December 2017 to May 2020), these partners of the ALLVIEW project team are represented and have contributed to the conception and compilation of the learning content. Therefore, they have a direct insight into the structure and setup of the learning packages and can classify them well for use in the ALLVIEW project structure.

The project FURN360 has created innovative didactic learning contents to promote the integration of the Circular Economy principles into the furniture and woodworking sectors. The project has comprised a joint curriculum, didactic materials, and a collaborative platform in line with the needs of different target users identified: learners and workers from the furniture, woodworking, and related sectors and professionals and entrepreneurs willing to create new businesses towards the circularity of furniture and woodworking products. The learning categories in the project introduce the topic of circular economy with basic questions and problems and then focus in detail on the influences and potentials of circular economy.

Task 2.1 is led by WULS, with the following participants: ULUB, CENFIM, INNOVAWOOD, FCBA, CETEM, KIT

# Nº 2

Data collection methods



For T2.1 and T2.2 tasks, a draft for a guide was prepared to aid the partners in the WP2 activity, which means that it was not mandatory but recommendation to be followed.

The draft guide consisted in recommendations of where to search for data, like:

1. Existing partner's projects
2. Emerging partners' projects
3. Existing and emerging European projects with developed materials, shared with Creative Commons Attribution-Share Alike 4.0 International License.
4. University Resources
5. Online courses
6. Partners' and European pages with reports and articles

It was recommended that search was performed both in English (if the site/material is also in this language) and in the native/s language/s of the participant's countries, with special pressure put on terminology, as with a high specific trade, there could be some mistakes in the terminology, suggestions to find a dictionary in the language you are looking for or any other mean to check if the translations are valid were made.

Proposed materials:

1. Learning Units
2. Programmes – Curricula
3. Online courses
4. Reports
5. Specific literature

Considering possible misunderstandings, a specific folder for each task in the MS Teams Files was created, inside the WP2 folder, for saving digital objects. It was recommended to name them with the same title as given in the Description Table, and if it's not possible to use abbreviations or change to English alphabet (problems with national letters are common).

Proposed description table of digital objects was discussed and agreed with WP1 leaders.

Table 1. Description table for digital objects in the database collection task

Category	Description
Topic	Field: General / Furniture / Woodworking / Management
Type of the document	Digital/Paper/Video/Infographic/Training Course/Digital Platform
Language	English/Other language
Date of creation	DD/MM/YY
Title of the qualification	Title of the qualification
EQF/NQF level of the qualification	Focus on EQF 4/5/6
ECVET points	When specified
Learning outcomes	Description of the main learning outcomes achieved after the course completion
License type	Whether we can reuse it as a resource, or add as a reference only
Source	The institution or project that holds the digital object
Link	A permanent link to the exact webpage where the digital object is hosted (please make sure of the permanency, most of the times it's not valid to copy/paste the search bar. In most of the webs there is one already shown in the description)
Description	A brief description of the content of the digital object
Archive name/folder name	The name you are giving to the digital object
Media type	(Image, video, text, infographic, etc.)
Institution responsible	The name of the partner
Keywords	4 or 5 keywords to describe the digital object
Relevance	Contemporary, Outdated etc.



# Nº 3

Results

Efforts of searching with comprehensive course on circular economy in wood sector, lead to the following results in terms of both online and blended courses:

Table 2. Courses on circular economy dealing with furniture sector

No	Topic	Title	EQF	ECVET
1	General	Circular Economy in the wood and Furniture Sector <a href="http://making40.eu/index.php/przykladowa-strona/module2/">http://making40.eu/index.php/przykladowa-strona/module2/</a>	5	3
2	Furniture	Eco and sustainable design <a href="http://making40.eu/index.php/przykladowa-strona/module2/">http://making40.eu/index.php/przykladowa-strona/module2/</a>	5	3
3	Management	Circular Economy: An Introduction <a href="https://www.edx.org/course/circular-economy-an-introduction">https://www.edx.org/course/circular-economy-an-introduction</a>	2	1.5
4	Other specific	A Circular Economy of Metals: Towards a Sustainable Societal Metabolism <a href="https://www.coursera.org/learn/circular-economy-metals">https://www.coursera.org/learn/circular-economy-metals</a>	2	1.5
5	Furniture	FURN360 Module 1: Circular Economy: An Introduction E-Learning Platform (Registration required): <a href="https://training.furn360.eu/">https://training.furn360.eu/</a>	4	0.26
6	Furniture	FURN360 Module 2. Circular Economy in the furniture industry E-Learning Platform (Registration required): <a href="https://training.furn360.eu/">https://training.furn360.eu/</a>	4	0.46

7	Furniture	FURN360 Module 3. Circular business model innovation in the furniture industry E-Learning Platform (Registration required): <a href="https://training.furn360.eu/">https://training.furn360.eu/</a>	4	0.5
8	Furniture	FURN360 Module 4. Business management in the circular furniture industry E-Learning Platform (Registration required): <a href="https://training.furn360.eu/">https://training.furn360.eu/</a>	4	0.32
9	Furniture	FURN360 Module 5. Sustainability in the circular furniture industry E-Learning Platform (Registration required): <a href="https://training.furn360.eu/">https://training.furn360.eu/</a>	4	0.5
10	Furniture	FURN360 Module 6. Marketing the circular furniture E-Learning Platform (Registration required): <a href="https://training.furn360.eu/">https://training.furn360.eu/</a>	4	0.46
11	Furniture	FURN360 Module 7. Supporting by advanced Key Enabling Technologies E-Learning Platform (Registration required): <a href="https://training.furn360.eu/">https://training.furn360.eu/</a>	4	0.52
12	Management	Circulair Ondernemen <a href="https://www.vdab.be/opleidingen/aanbod/O-AMI-801047/cursus/C-AMI-195223/Circulair_ondernemen-online">https://www.vdab.be/opleidingen/aanbod/O-AMI-801047/cursus/C-AMI-195223/Circulair_ondernemen-online</a>	3	5h
13	General	Basic Concepts on Eco-design <a href="http://www.ecosign-project.eu/">http://www.ecosign-project.eu/</a>	N/A	3

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14	Furniture	Product-Service Development for Circular Economy and Sustainability Course <a href="https://www.katche.eu/circular-economy/training-materials/">https://www.katche.eu/circular-economy/training-materials/</a>	N/A	N/A
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Other than complete courses, the team identified several contemporary reports, dealing with circular economy in the wood and the furniture sector (some proprietary), all contemporary from the years 2019-21.

*Table 3. Reports on circular economy dealing with wood and furniture sector*

No	Topic	Title	Author	Content
1	Wood	Quantity assessment of post-consumer wood and wood energy biomass created in Europe per annum on the example of 2017	OB-RPPD in Czarna Woda Maria Antoni Hikiert Leszek Danecki	The aim of this study is to assess the amount of wood (biomass) that is produced in Europe per year and which ultimately releases carbon dioxide accumulated in wood as a result of combustion for heating and energy purposes, or composting for biological purposes. Wood (woody biomass) which remains in the finished products of the wood industry, cellulose-paper industry and other industries, is a kind of carbon dioxide storage for the period of its use.

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3	Furniture	<p>'Circular Economy in the Furniture Sector: Overview of Current Challenges and Competence Needs'</p>	<p>Ecores (Belgium) University of Vaasa (Finland) CETEM (Spain) AMUEBLA (Spain) CENFIM (Spain) KIT (Germany)</p>	<p>This report provides an overview on how the circular economy is currently being implemented within the furniture sector. By focusing on existing practices, challenges and opportunities at the micro-level, the main objective of this report is to identify the necessary skills and competences needed to support the transformation of furniture companies towards a circular economy. This report was developed in the framework of FURN360 (<a href="http://www.furn360.eu">www.furn360.eu</a>), an Erasmus+ EU founded project aiming at developing a novel curriculum supporting companies from the furniture industry to implement circular practices.</p>
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4	General	<p>Universal circular economy policy goals. Enabling the transition to scale.</p>	<p>Ellen MacArthur Foundation</p>	<p>This paper sets out five universal circular economy policy goals around which governments and businesses can align to achieve their common objectives. Applicable across sectors and local contexts, these policy goals can – working in conjunction – help governments build healthier economic recoveries and lower the cost of transition for business.</p>
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5	Furniture	Circular economy opportunities in the furniture sector	Alex Forrest, Mark Hilton, Ann Ballinger and Daniel Whittaker	This report was commissioned by the European Environmental Bureau (EEB) to contribute towards the debate in Europe around the challenges and opportunities for transitioning towards a circular furniture sector. The intended audience for the study findings includes policy makers and key actors across the furniture value chain.
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6	Furniture	The Furniture Sector and Circular Economy 2.0	EFIC - European Furniture Industries Confederation	EFIC, the European Furniture Industries Confederation, has identified a number of challenges and opportunities linked to the transition to a circular economy, covering the different phases of furniture manufacturing, from the supply of materials to the end of life phase, and is hereby providing sector specific expertise for EU Circular Economy policies. The European furniture industries are ready to collaborate with EU institutions to create suitable tools for the sector, enabling the industry to move into the right direction.
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Also, 9 webpages deeply dealing with that subject were found:

Table 4. Webpages on circular economy dealing with wood and furniture sector

No	Topic	Name	Link	Description
1	General	Infographic on the circular economy		In a circular economy, products and the materials they contain are highly valued. This contrasts with the traditional, linear economic model, which is based on a 'take-make-consume-throw away' pattern. In practice, a circular economy minimises waste through reusing, repairing, refurbishing and recycling existing materials and products.
2	General	Learning Hub Ellen MacArthur Foundation		Guide through these curated learning experiences. Expand your understanding of the circular economy and learn how the concept can be applied to different parts of the economy. resource map contains links to our educational resources, which include videos, presentations, graphics, business case studies and articles



				<p>Harmonised data and interactive Sankey diagram on biomass supply, uses and flows in the EU, compiled by the JRC. The diagram enables deeper analysis and comparison of the different countries and sectors across a defined time series. Distribution of the bio-based industry (and biorefineries) in the EU, including the following production: bio-based chemicals, liquid biofuels, bio-based composites and fibres, biomethane, pulp&amp;paper, sugar, starch and timber.</p>
3	Other specific	EU Biomass Flows, Bioeconomy, Bio-based industry and biorefineries		
4	Other specific	Allthings.bio portal		Online resources about the bioeconomy and bio-based products
5	General	The EBBEY Community of Practise		The EBBEY Community of Practise contains all the practical learning and support materials on Bio Based Economy topics which were collected within the European EBBEY-project (2013-2015).
6	General	With knowledge and skills to more competitive and more beautiful world		Through training, they strengthen the internal structure of companies, thereby also improving their market presence in the key area for the transition to a circular economy.

		<p>Potential of biomass for development of advanced materials and bio-based products</p>	<p>Strategic direction of the programme is to exploit the potential of biomass for development of advanced materials and bio-based products.</p>
<p>7</p>	<p>Other specific</p>		
<p>8</p>	<p>General</p>	<p>SRIP - Circular Economy</p>	<p>Connection of Slovenian business subjects, educational and research institutions, non-governmental organisations, and other parties, in collaboration with the state, into new value chains according to the economic principles of closed material flows.</p>

<hr style="width: 50px; margin-bottom: 10px;"/> <p>9 Furniture</p>	<p>SAWYER: holistic approach for the identification of Skills and safety needs towards a growing sustainability &amp; circularity of furniture sector</p>	<p>The SAWYER project aims to facilitate the transition of European furniture companies to a more circular economy. The project will study the main legislative and voluntary instruments that can facilitate this circular economy transition and it will analyse how they are expected to affect and transform the European furniture sector in 2030 (2 years, 01/03/2019 – 28/02/2021). This project has been funded by the European Commission call: Support for Social Dialogue VP/2018/001 – Grant Agreement Reference VS/2019/0027.</p>
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Found resources from all WP2 work package were collected into single database, because of the technical issues of using separate ones (duplicates, and inconsistencies).

All circular economy courses of Making40, Furn360, In4wood, Ditrarna and Ecosign projects were catalogued, additional free courses come from universities and institutions. Full reports, theses and comprehensive webpages were added as additional reads and resources. Full results listing database in the attached document “WP2 ALLVIEW Learning resources database”

Nº 4

**Contents**

Circular economy, as a fashionable topic, is accompanied by numerous training courses, books, reports, and all sorts of webpages. Main challenge was to pick resources which are:

- Free
- Systemizing of existing knowledge
- Applicable in HE and VE studies

Resources coming from the existing projects (especially courses) should be treated as most valuable, because as a standard these are conforming to the above requirements. Additional value of these is that selected resources are systemizing existing knowledge, keeping in mind the applicability in Higher Education and Vocational Education study programmes and in target sector companies.

Mentioned project resources and especially courses are coming from wide educational and professional market surveys.

For example, **FURN 360** project curriculum is based on the numerous surveys, with results are presented within the report: "Circular Economy in the Furniture Sector: Overview of Current Challenges and Competence Needs" and made into curriculum "FURN360 ECVET and EQF harmonization" both available for download (<https://www.furn360.eu/downloads/>).

**Making 4.0** courses also came to life from numerous surveys within European and Asian region, summarized in the report "Report of gaps and needs of the Malaysian HE and Industry in comparison with Europe" and developed Joint Curriculum with all results available for download from Materials section (<http://making4o.eu/>)

**In4Wood**, with its "Report on the need of the Furniture Industry" resulting in "In4Wood Training Path and Learning Content" and "In4Wood Common Curriculum Proposal" came from surveys and consultation of furniture manufacturers, VET/HE communities, KETs experts, available for review on the webpage (<https://in4wood.eu/public-documents/>)

**Ditrama** project, with its "Guide for the Digital Transformation Manager (DTM) for the Furniture Sector" also deals with found gaps basing on surveys within interested parties, and resulting in curriculum "Joint Curriculum Digital Transformation Manager" and digital transformation course, overlapping with circular economy with add-on modules, available for review on the project webpage (<https://ditrama.eu/en/downloads>)

**Ecosign** project, with new joint curriculum and a training course for European eco-designers that will add skills and competences to the designers regarding environmental technologies, was also based on expert panels dealing with packaging, textile and electronics with obvious at least utilization in furniture industry, is also dealing with circular economy in the sector

to the great extent, with materials available at <http://www.ecosign-project.eu/> within expert panels and online course sections.

The Knowledge Alliance on Product-Service Development towards Circular Economy and Sustainability in Higher Education (KATCH\_e), developing training materials for enabling Circular Economy in the construction and furniture sector, addressing students and professionals in industry and specifically focusing on the development of sustainable product-services, also bases on the stakeholder network in four European countries, with materials and knowledge base available at webpage (<https://www.katche.eu/>)

Reassuring, all these mentioned and other listed free **resources** developed within last three years, were based on documented surveys, expert panels, and cooperation with industry. These resources, as fully documented should be regarded as a comprehensive and contemporary, with easy to pick modules and even full courses and suggested listed literature (not always free) regarding educational institution or entrepreneurial needs.

Considering knowledge offered, available list of modules is enormous, partly overlapping due to the different writing style and definitions, let's try to summarize offer in some key points:

*Table 5. Availability of selected key points - topics in the courses database*

No	Topic	Availability
1	Introduction to Circular economy, Bioeconomy	Available, 4 times
2	Big picture of W&F EU industry	Available, 3 times
3	Recycling	Available, numerous
3.1	Recycling of other materials	Available, full courses on metals and textiles
4	EcoDesign	Available as a whole course and 3 separate modules
5	Regulations – incentives	Available, 4 times

6	Labels and certificates related to the sector	Available, 4 times
7	New business models	Available, 5 times
8	Repair and reuse	Available numerous times, within business models, recycling ecodesign
9	Energy use & efficiency	Available
10	Introduction of CE	Available, in labels in certificates, 4 times
11	Circular economy indicators & means of evaluation	Available
12	Climate change	Available in Roadmap to climate neutral economy
13	Biodiversity	Available in Roadmap to climate neutral economy
14	Health & wellbeing	Available in Universal circular economy policy goals
15	Waste management	Available, 2 times
16	Distribution & Logistics?	Available

Within the ALLVIEW project, which develops its own wood-bioeconomy course, eventual gaps found are covered within Deliverable D 2.3 - Development of Circular Economy training materials in Wood, which selects resources basing on the additional market survey performed in 2021.

Regarding the amount of potentially available resources, the challenge in WP2 is to identify the most relevant input regarding:



- The sector targeted (wood and furniture sector)
- The possibilities to reuse and under what conditions the existing materials
- The effort to transform useful resources into learning resources
- The availability of these resources in seven languages
- The localisation of some training materials to adapt them to national specific issues.

Current resources on bioeconomy, due to enormous popularity are growing exponentially. It is suggested that not to double the work, in filling eventual gaps (like other specific categories, which were not dealing with wood) and providing extra materials beyond wood-specific bioeconomy, it would be wide to utilize external resources like separate projects or databases already available. For example:

In the **Transition2bio** Horizon2020 Project (<https://www.transition2bio.eu/>) one of the results is the collection of existing contents, tools and good practices of general bioeconomy transitions. Database already consists of **97 bioeconomy projects** (Mostly Horizon2020)

Publicly available collection consists of:

- Case study
- Factsheet
- Games
- Good practice
- Infographics
- Policy brief
- Training material
- Video

Current database of bioeconomy resources of general bioeconomy reaches close to 1000 positions, with categories like:

- Article
- Case Study
- Database or repository
- Fact Sheet
- Games
- Good practice
- Infographics

- Multimedia/video
- Platform
- Policy Brief
- Presentation
- Project deliverable
- Project progress/final report
- Publication, Recommendation
- Training material.

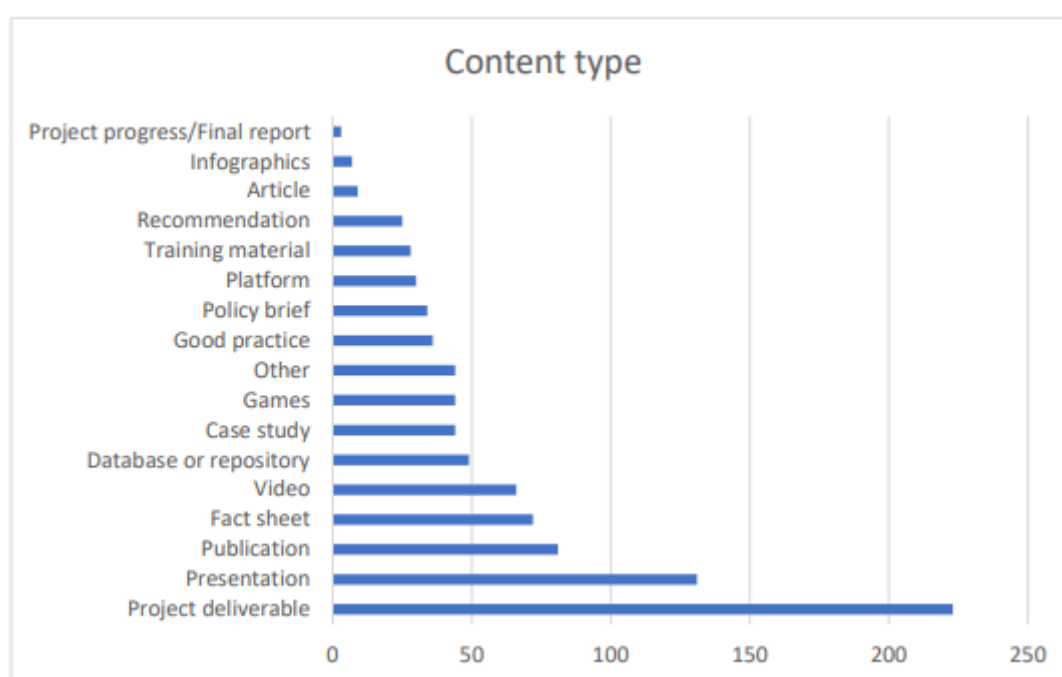


Figure 1 Transition2Bio resources database structure (source: Transition2Bio)

Popularity of topic, considering availability of current close to 100 projects, puts a question of necessity of further collection of other than wood-specific courses and resources.

Nº 5

**Summary**

Bioeconomy awareness is exponentially growing in, and beyond the European Union. Available contents and materials for the awareness-raising are numerous and high quality, especially considering number of projects, institutions and scientists involved in the area. All assumed resources were gathered into a database, dealing with the subject, and showing contemporary state of the art nature.

Due to the challenging time and continuous delivery of online resources, like communication, reports, articles education resources assumed to be utilized within the T2.1 work package it is suggested to leave data collection open, with periodic updates, and utilization of external resources to save workload.

Attached documents:

1. WP2 ALLVIEW Search Guide
2. WP2 ALLVIEW Learning resources database
3. Transition2Bio database report



# av Allview

