SAWYER
Skills and safety needs in a circular furniture sector

Conclusions & Recommendations

February 2021 - V1

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in a circular furniture sector

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This document has been prepared based on the inputs coming from the following experts:

- Jeroen Doom (VET)

- Juan Carlos Alonso (Circular Economy)

- Ellen Schmitz-Felten (OHS)

Juan Carlos Alonso (external expert)
Massimiliano Rumignani
Julio Rodrigo Fuentes
Joaquim Solana Monleón

Design and layout: Silvia Claramunt

INDEX

List of Acronyms

B2B.- Business to Business

COM –Communication of the European Commission

CVTE.- Continuing education and training

EDS.- Education for Sustainable Development

EU - European Union

KSC.- Knowledge, Skills, and Competences

OHS.- Occupational Health and Safety

ReSOLVE.- Regenerate, Share, Optimise, Loop, Virtualise, and Exchange,

TVET.- Technical and vocational education and training

VET.- Vocational education and training

1. CONCLUSIONS

Furniture manufacturers embracing circularity and circular practices will become more and more common, as circular economy is key to tackle climate and environmental challenges and the demands for contributions from the sector will constantly increase. Circularity is in its early stages and results will be seen in the medium-long term.

Two recent EU initiatives will facilitate this transition to a circular economy. On the one hand the European Green Deal (COM(2019) 640 final), which will support and accelerate the EU's industry transition to a sustainable model of inclusive growth and on the other hand the new Action Plan on Circular Economy (COM(2020) 98 final), in which the furniture sector is specifically mentioned as one of the priority products groups in the context of the value chains targeted by the Plan.

The SAWYER project vision statement by 2030 has been stated as follow:

*By 2030, with a broadly **digitalised furniture sector**, the wood-based furniture manufacturing industry will offer **products and services** with **environmentally conscientious design** based on **low impact and traceable raw materials, sustainable manufacturing processes**, and promotion of the **best usage and recovery scenarios** for materials and discarded products. Customers (B2B or B2C) will demand more detailed information about products and their **sustainable characteristics**, including life-cycle indicators, and consumer empowerment will be key in the success of circularity objectives. Authorities (at local, national and European level) will facilitate circularity by boosting **sustainable end-of-life scenarios** for materials and wood-based products, expanding **green public and private procurement schemes** and promoting **material efficiency policies**.*

In the analysis implemented in SAWYER, specific factors/actions showed a higher impact on most of the assessed occupational profiles, such as:

- Shift to renewable materials;
- Reuse products throughout their technical lifetime;
- Prolong products lifetime through maintenance and repair;
- Prolong products lifetime through design for durability;
- Increase performance/efficiency of products;
- Increase efficiency of production processes;
- Remanufacture products and/or components;
- Recycle materials;
- Promote the cascade use of wood;
- Virtualise indirect aspects of the product;
- Replace old materials with advanced renewable ones and
- Apply new technologies.

In order to cope with the challenges posed by the circularity transition and to exploit the opportunities offered by it, EU furniture sector stakeholders will have to look at this transition as part of the sector **Twin Transition** (green & digital), as they are closely related. As DIGIT-FUR project results forecasted, the wood furniture manufacturing industry will offer personalised smart products and services based on digital manufacturing systems supplied by resource-efficient and sustainable industries. A number of different technologies (e.g. cheap advanced sensors, IoT/IIoT, next generation Internet, data analytics, artificial intelligence, VR/AR, collaborative robots, etc…) will offer transformative business potentials, both in terms of products, which can be developed and produced, and of the manufacturing processes itself, for those able to utilise them. Another demanding challenge for the wood furniture industry will be the provision to the workers' necessary skills to effectively deal with this digital transformation.

Overall, Industry 4.0 technologies will greatly impact the sector production processes during next years and will benefit as well the sector transition toward a more circular economy.

Looking at this from an overall perspective, the sector Twin Transition should represent the framework of reference for all future sector analysis, companies' innovation for products and production processes, innovative business models, sector policies and consequently the sector social dialogue.

From a digitalization perspective, the furniture industry is rapidly transforming from a traditional industry into a computerized, industrial sector. Based upon the expected changes in the analysed job profiles - using the McKinsey levers and taking into account the Industry 4.0 technologies - DIGIT-FUR forecasted the **changes in the demand for skills, knowledge and competences**. Future employees in the furniture industry not only have to be able to efficiently perform tasks, but they have to possess as well the skills and ability to recognize and adopt continuous changes. The demanded qualification level will become higher and more specialized, as the core of the skills becomes more abstract, due to digitization/computerization.

There is no increased need for hard skills, but the hard skills or technical skills need a complete integration of (all the relevant) digital skills. Technical knowledge remains essential and forms the foundation; cognitive, social and behavioural skills will become a priority. People will no longer be selected on the basis of their diploma, but in function of their mindset. Each individual will become responsible for his or her own proficiency in learning and self-improvement.

For some job profiles, **new green skillsets** will be required, as there will be some new, specific tasks related to disassembling and re-using, remanufacturing, recycling and upcycling. These new skillsets are especially (more) important for the tasks of the "practical" profiles. We name the following:

- disassembling wood-based furniture products
- examining disassembled pieces for further steps (reuse, remanufacturing, recycle, upcycle)
- repairing wood-based furniture pieces, where needed

These new green skillsets will also have an impact, though not so significant, on those profiles that are managing and taking strategic decisions within the company. These skills come as a "topping up" on the existing, necessary skillsets for the examined profiles.

Additionally, **generic green skills, knowledge and competences** were defined as necessary for social, economic and environmental developments within the wood furniture sector. These generic green skills are aligned with key competencies or soft skills, which have been contextualized within the perspective of environmental awareness and the understanding of sustainable development and circular economy.

The furniture industry Twin Transition poses **new challenges for occupational health and safety**. The furniture industry can be **truly sustainable** (environmentally, socially and economically) only when ensuring the safety, health, and welfare of its **most crucial resource: its workers** – or at least, it cannot be sustainable without protecting in the most effective way their safety and health.

New types of workplaces, new processes, new technologies and **new materials/products** can affect the safety and health of workers, but if properly planned and deployed **workers' health and safety can clearly be improved**. From the digitalization perspective, robots and digital technologies can make work that is physically demanding or monotonous, easier, more efficient and safer. Workers may be removed from hazardous environments, and sensors may automatically indicate whether a machine needs maintenance and thus reduce the risks of machinery failure and incidents. Typical hazards in the furniture industry such as dangerous substances, dust, dangerous machines and tools will still remain, but the risk of being exposed to those risks will be reduced.

The analysis shows that the transition toward a more circular economy will **improve the global environment**, but under no circumstances it should reduce workers' health and safety. For this reason, we, furniture sector stakeholders, need to ensure that this transition and its new technologies or working processes do not lead to new hazards. And we need to ensure that new and recycled materials cannot put workers at risks of "new" or hidden dangerous substances. **Circular economy in the sector**, giving equal consideration to Occupational Health and Safety and to environmental issues, should be **deployed through safe and efficient machinery, working processes and materials** able to control workers' chemical and physical risks. The application of **ecodesign** concepts to products should facilitate recovery and repair operations, reducing ergonomic risks, and should reduce the content of hazardous substances, decreasing chemical risks in the entire value chain. Workers' safety and health could increase by integrating the OSH management into companies' quality management systems.

The Furniture sector Twin Transition, if not properly guided and deployed, could lead to new challenges and stress problems for workers. Increasing workloads and task complexity, excessive working hours and constant reachability give rise to tension and suffering at work, leading to psychosocial risks (EUOSHA, 2015). In order to avoid these new risks the **acquisition of new knowledge, capacities and flexibility** to properly deal with increasing automation, new processes and the development of new products become a real and key need for sector all workers.

The results of these analyses of the SAWYER project are useful to:

a) properly understand how sector workers' jobs and their safety will evolve due to the impact of the circular economy transition;

b) to prepare companies and workers to face and exploit the upcoming challenges and opportunities; and

c) to have a stronger basis for future European Social Dialogue discussions and collaborations.

Also, these combined analyses on digitalisation and circularity – Twin Transition - have shown relevant synergies between them. For example related to:

- how environmental information about products (e.g. hazardous substances content, reusable parts, recyclable materials, etc…) has to be collected and communicated along the supply chain, until the customer or recycler is reached;
- how to shift from products to services (virtualisation, dematerialisation, servitization, etc.);
- how to reduce the environmental impact of the manufacturing processes by using new technologies (e.g., energy efficiency, waste reduction, raw material optimisation, etc.).

This synergic analysis reinforces the vision that the future EU furniture sector will be greatly impacted by the Twin Transition and that all stakeholders will have to carefully cope with digital and circular challenges to exploit at the best all the opportunities offered by them.

2. RECOMMENDATIONS

The path to a circular economy **requires the collaboration of different actors**, ranging from policymakers, industry, experts, academia and consumers. To activate and speedup the transition toward a more circular economy, the **industry offer of more circular products** should expand together with the **market and consumers demand** for such products. In order to achieve this, **Vocational Education and Training providers and policymakers play a key role** in pushing these two key trends, and for this reason, in the following parts of this document you can find different specific recommendations for policymakers and the VET system able to support them in achieving these relevant goals.

Despite the above and the fact that several of the following recommendations focus on coping with the challenges posed by the sector transition toward a more circular furniture sector, it is important to always keep in mind that at practical level, the sector will be simultaneously and jointly impacted by its Twin Transition (digital & green). This is necessary not only to enable sector stakeholders to tackle sector challenges, but especially to allow them to successfully exploit the opportunities offered by their specific and joint impact.

Policymakers

Ensuring the success of the transition toward a more circular economy in the framework of the sector Twin Transition requires that **harmonized rules are put in place at EU/international level** and that EU initiatives are implemented in **a consistent way by the Member States**, reducing the risk of fragmentation of the internal market and **avoiding barriers** to free movement of (more) sustainable and circular goods.

To ensure a smooth implementation of EU initiatives, **simple and smart circular economy rules, clear definitions** at EU level and a **common language** are needed, especially when it comes to parameters measuring circularity, such as 'long lifetime', 'reuse', 'recyclability', among others. This is key to **provide harmonized information to consumers**. The **EU Sustainable Product Policy Initiative** should provide clarification and rules on these issues. One of its cornerstones will be widening the scope of the Ecodesign Directive to cover non energy-related products, such as furniture. The wide range of products that are considered 'furniture' and the diverse materials used in their production makes this a **complex sector to address**. Ecodesign/circular design criteria will not work for all products in the same way. In this context, it will be important to take into account the complexity of furniture, the need for a **step-by-step** approach, for **harmonisation** at European **legislative level** and **across policies** and a dialogue should take place with the industry[1]..

When it comes to barriers to circular design, **key aspects to overcome** are the availability of **substitution materials and parts**, as well as the **lack of information from suppliers** on substances of concern and stringent national regulations leading to the use of unwanted chemicals (such as the case of toxic flame retardants which are often needed to comply with flammability requirements). In this framework, the EU Chemical Strategy for Sustainability and the Sustainable Products Initiative should promote the **reduction of substances of concern** in furniture products, reducing workers' exposure to chemicals. As documented by the Alliance for Flame Retardant Free Furniture[2], flame retardants migrate out of products and accumulate in the environment and their use counteracts the objectives of a circular economy.. These chemicals have no proven fire safety benefit and there is a large base of evidence of their harmful effects on **human and workers' health**, increased **fire toxicity** and the environment.[3] [4]. They represent an **avoidable risk** for workers during production, sale and end-of-life processing. This is a common risk for upholsterers and it is expected to **decrease or disappear** with the industry **transition** toward a more circular economy and if the upcoming policy tools will address the unneeded **use of toxic flame retardants** in furniture.

[1] https://9e2160bf-a0b5-460b-aec7-e9af818978ee.filesusr.com/ugd/a1d93b_457a04fa809244cf97342a97f2a796b8.pdf
[2] https://safefurniture.eu/
[3] https://5xh.e1a.myftpupload.com/wp-content/uploads/2020/04/POSITION-PAPER-Aliance-for-Flame-Retardant-Free-Furniture-15APR2020.pdf
[4] https://safefurniture.eu/resources/studies/

As part of the sector Twin Transition, the sector transition to the circular economy will depend on other parameters too, such as the **increased digitalization, innovative tools** and **ongoing innovation** and **research efforts**. These efforts and investments on circularity and development of more environmentally friendly technologies should be supported by **financing programs** such as Horizon Europe, etc. Appropriate investments should facilitate this transition and guarantee that it reaches all players involved, especially SMEs, and promote the collaboration among companies and stakeholders. The new EU Industrial Strategy should promote and facilitate the Twin Transition looking simultaneously at the potentialities of the industry digitalization and circularity.

The policy initiatives, such as the European Green Deal or the Circular Economy Action Plan should **stimulate market demand and offer of circular products**, promote the **development of new business models**, for example product-as-a-service, promoting reuse, refurbishment, remanufacturing, recycling, disownership models, models based on enabling care, repair, and refurbishment, repurchases or B2B procurement.

Due to the enormous impact of the COVID19 pandemic, the EU institutions and Member States efforts should be focused on the recovery from the social and economic crisis, using the stimulus package (e.g. Next Generation EU, the Recovery and Resilience Facility and the European Social Fund Plus) also for fighting climate change, for the promotion of digitalization and circular economy and to **facilitate workers' training on new technologies and green skills**, especially for the lower skilled workers, women, migrants, youngsters as well as older workers.

Vocational Education and Training (VET)

Education is the force for the future because it is one of the most powerful instruments of change. One of the greatest problems we face, is how to adjust our way of thinking to meet the challenge of an increasingly complex world. We must rethink our way of organizing knowledge. This means breaking down the traditional barriers among disciplines. We must **redesign our educational policies and programs**. And as we put these reforms into effect, we must keep our **sights on the long term** and honour our tremendous responsibility for future generations.

The Twin Transition of the furniture industry creates a **demand for new specific competences and skills** of the workforce. Anticipating and building skills for the future is essential in this rapidly changing and greening labour market. This applies to all changes in the types and levels of skills needed, as well as in occupational and technical areas.

The current supply of skills often does not match this demand for new and adapted skills. There is a **clear gap among the skills needed** by the Twin Transition of the furniture sector **and the current education offer and provision**.

UNESCO described **Five Dimensions of Greening TVET (Technical and Vocational Education and Training)** as a translation of the **three dimensions of sustainability** that need to be addressed - **environmental, economic, and social** - into a key framework for understanding the approach to Education for Sustainable Development.

In relation to the Twin Transition, we also added the digital aspect.

Based upon these five dimensions of greening TVET, we can recommend the following:

1.   Green and digital campus

     Managing campus with regards to energy, water, waste and pollution management.

     For schools and training centres, it is almost **impossible to keep up with all the investments needed** by the Twin Transition, as the new technologies are evolving increasingly rapid.

Therefore, a green and digital campus should also focus on **hybrid learning environments**, including in their formal training, an offer of work-based learning, dual learning, and apprenticeships. A green and digital campus invests in digital learning methods, in e-learning through MOOCS (Massive Open Online Courses), in green curricula.

The green and digital campus is an **open campus**, where start-ups have their place, where companies are welcomed to invest as a partner in new technologies, in green research and in new, flexible curricula.

2.   Green and digital curriculum

Integrating Education for Sustainable Development (ESD). Green technology, clean technology, green jobs and greening existing jobs. Therefore, there is a need of green programs and courses, green practices in classes and workshops and a better interaction between industries and educational institutes.

VET systems need to be **adaptive and continuously evolving** (in a smart way).

As inspiration, we present the following examples on how to achieve green(er) skills.

- Adapting labour market information on the greening and digital economy in the development of new curricula and reviewing existing curricula with green and digital aspects. This can be done by sector councils, advising organism with captains of (green) industry, digital champions, or advisory committees with local businesses (for regional adaptation, context of local labour market, etc.).
- In order to introduce circular economy in the curricula of VET schools, businesses could come to the school and talk about how they manufacture products. Then they hand over their products to pupils/students to be redesigned in a circular economy perspective (http://www.circlevet.eu - Steve Parkinson).
- The design and adaptation or modification of the curricula should respond or even anticipate the changing skill needs for the Twin Transition. The design of programs and modification of courses and learning outcomes in curricula that are set up in a **modular** way or **based upon workplace-based training** makes it very flexible to integrate the new skills demand. Many courses and programs are already being modified to integrate (some) aspects of circular economy, of sustainability and/or of digitalization. But this is too often only 'sideways' and too limited. For example, using wood from sustainable sources is often only taught in theoretical lessons, but not included in the procurement of the used resources in the workshops. Digitalization is taught as a concept, as a theory, but often not integrated in the machine-workshops, where the computers are outdated and unsuited for demanding VR/AR applications.

  Besides the adaptation of the curricula for students, we also need adapted training paths for retraining and workplace-based training for the 'upskilling' and 'reskilling' of the workforce.

- The continuous learning (CVET) is also an important level to address the above-mentioned recommendations for the curricula. The above-mentioned **new delivery methods** (modular, workplace-based, web-based distance learning, hybrid learning methods, off-campus training, etc.) can be used to offer **on-demand and personalized training pathways** for everyone who is interested. It is important to adapt the method

to the specific target groups and to focus on the changing of the mindset, rather than addressing purely technical issues.

- The Twin Transition must be spread out through all departments, integrated in all branches and within all course programs and curricula.

Such an integrated, sustainable approach can consist of:

- o Developing skills, necessary to **implement** sustainable and digitized solutions;
- o Making connections between the chosen program/curriculum and the Twin Transition;
- o Being part of inter-connected worldwide systems;
- o Integrated understanding of social, economic and environmental systems and discussing practical solutions to the Twin Transition;
- o Sustainable thinking and decision-making as contribution to the process of solution-building for social, environmental and economic crises;
- o Engaging students in learning 'for', not just 'about', the Twin Transition.

3. Green and digital community

Adapting the community by capacity building, renewable technology and resource support.

Effective methods to **anticipate future skill needs** include **sustained dialogue** between employers and employees, companies and trainers, coordination across governmental institutions, labour market information systems, employment services and performance reviews of training institutions. Collaboration and co-operation at all stages (decision makers, policy makers, practical, organizational, etc.) is needed. There is an enormous need for the **involvement of all stakeholders**, training providers, social partners (firms, employers' and employees' organizations and federations), universities and academic world, sectoral organizations, public employment services and all the relevant governmental partners (ministries of education, work, environment, digitalization…). For example, for the recognition of skills, to develop **skills alliances within the sector, but also cross-sectoral**.

4. Green and digital research

Fostering research in the areas of renewable energy, green innovations and waste recycling.

In relation to the Twin Transition, we recommend more joint actions concerning the **research on the recognition of skills, developed outside the normal learning pathways**. This recognition - which becomes more and more important - must be transparent and supported by all stakeholders, including governmental partners. After only a few years away from the (high-)school/university, the acquired knowledge and skills become somehow obsolete, due to the rapid changing environment in the light of the Twin Transition. Only Continuous VET, be it in a formal, an informal or a non-formal way, guarantees the lasting validation of a degree/diploma.

5. Green and digital culture

Promoting a culture of green values, green attitude, green ethics and green practices.

In relation to the Twin Transition, we would like to add a **digital culture** (digital attitude, digital ethics and digital practices).

Besides this green and digital culture, we recommend adapting a **learning culture in the company,** integrating informal and non-formal learning. Workers need to be given time or freed up to properly learn and benefit their companies. Thanks to flexible and modular learning paths, on-site or off-site, work-based, just in time, where needed (in the right place and with the right format), when needed (at the right time), workers can learn throughout their working life and working situation. The challenge is to ensure that learners **access qualitative information** (see digital literacy). There must be given sufficient attention to the highly educated workforce. These employees will also become responsible to train the lower-skilled workforce. The **learning expectancy is increasing** and the **learning opportunities** as well.

Green skills

Studies on future skills demand endorse the importance of soft skills, collaboration and digital competences. The defined generic green skills also refer under these soft skills.

The needed digital competences and the generic green skills do not defer much. Often, it is the context and situation, objective or goal that starts from a different viewpoint. The following table shows the defined (new) generic green skills (on the left) and the needed digital skills (on the right), as they were defined in the Digit-Fur project. Because the digital skills were defined in a more general way than the generic green skills (which are more detailed), we can relate the digital skills more than once with the green skills (in italic).

Environmental awareness and willingness to learn	Digital literacy
Systems and risk analysis skills	Critical thinking and problem solving
Innovation skills	Curiosity and innovation
Coordination, management and business skills	*Initiative and entrepreneurship*
Communication and negotiation skills	Effective communication
Marketing skills	*Effective communication*
Strategic and leadership skills	*Initiative and entrepreneurship*
Consulting skills	*Effective communication*
Networking, information technology and language skills	Collaboration across networks
Adaptability and transferability skills	Agility and adaptability
Entrepreneurial skills	Initiative and entrepreneurship
Waste, energy and water quantification and monitoring	Information retrieval
Material use and impact quantification and monitoring in procurement and selection	*Information retrieval*
Material use and impact minimization (impact assessment)	*Information retrieval*

Besides these generic 'soft' skills, we also need to integrate and embed the technical green and/or digital skills.

<u>Formal VET</u>

Formal VET-training and education is broader than just labour market oriented and remains important. The new increased **demand for the right soft skills needs to be supported** in a stronger manner. Despite the importance of these soft skills, the system may not lose sight of **basic technical competencies** and the need for an up-to-date technical education remains. One can only be successfully creative in his/her job if one has also the basic skills.

- A **better cooperation** between education and sector is needed, especially for technical programs. The future sector employees must be able to efficiently perform tasks, but they also need the **skills and capacities to recognize the upcoming changes and to adapt to them**. The role of multidisciplinary skills and abilities is increasing significant, and **companies will demand higher and more specialized qualification levels**.
- This shift in competences also points out the importance of **professional qualification profiles** (set up by the sector), **as a base of the learning pathways** in education.

<u>Initial-VET vs Continuous-VET</u>

- There is an increasing importance of **demand driven systems** as apprenticeships, dual learning or workplace-based learning. These systems need to be implemented in both VET-systems.
- Existing initial VET systems and continuous VET systems need to **adopt the new green and digital technologies**. Educational partners and training providers must work closely together with companies. Not only technical skills and specialized domain-specific knowledge on the Twin Transition is needed. The defined generic soft skills are equally crucial.

Finally, we can conclude that for an up-to-date **learning provision system**, we need **collaboration** of all stakeholders and partners to successfully implement and integrate the new skills needs for this Twin Transition. Collaboration that requires that all the stakeholders' attention and actions focus in a complementary and collaborative manner.

Collaboration between VET regulatory and educational governmental entities is needed to integrate the new skills sets for a green and digital world, already in an early stage, such as in primary education and these skills must be further developed during secondary education.

Collaboration between **training providers and companies** is needed to provide flexible and adaptive learning paths, on-site or off-site, work-based, just in time, where needed (in the right place and with the right format), when needed (at the right time).

Collaboration between the **workers' social partners and associations** is needed to support and facilitate the conditions enabling the workers to obtain the needed proficiency and skills to face the Twin Transition in the sector. Sector **workforce** will need to adopt a new mindset of continuous learning (lifelong learning). They will have to continuously update their knowledge about the new OHS risks and act accordingly. Overall, each individual will become responsible for his or her own future skills and proficiency.

Together, in partnerships between employers, government and educational institutes, we can work on the development of demanded skills for the Twin Transition, to anticipate, build and enhance the skills of all stakeholders (teachers, students, parents, employers, co-workers, administrations, etc...). In this way, a bright future awaits us in the furniture sector.

Because in the future, every job will be a green and digital job!