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List of abbreviations

| | |
|------|------------------------------------|
| BSO | Business Support Organization |
| DTP | Danube Transnational Programme |
| SMEs | Small and Medium-sized Enterprises |
| VCs | Value Chains |

DanuBioValNet project

The DanuBioValNet project is a cross-clustering partnership for boosting eco-innovation by developing a joint bio-based value-added network for the Danube Region. DanuBioValNet stands for development of a joint bio-based industry cluster policy strategy, clusters connecting enterprises transnationally, new bio-based value chains in the Danube Region and eco-innovations for supporting regional development.

The DanuBioValNet project, launched in 2017 through a cross-regional partnership involving 17 partners from 10 Danube regions, will enhance transformation from a fossil-based economy towards an economy using renewable resources by creating bio-based value-added networks. The project will connect Danube actors in a bio-based industry to minimize greenhouse gases and to optimize biomass resource utilization. These measures are intended to improve the sustainability and regional development through diversification of the local economy while positively affecting the workforce. The focus on emerging transnational cooperation of clusters should serve to foster the bio-economy and eco-innovations and should lead to a strengthening of the regional economies.

The development of new bio-based value chains from primary production to consumer markets needs to be done by connecting enterprises from different regions and industries. However, due to a missing holistic transnational approach, the Danube actors in the current bio-based industry still operate disconnected and cannot properly benefit from their potential. Therefore, the aim of this project is to develop new methods, strategies and tools to connect enterprises transnationally. Clusters represent groups of industries that are closely linked by common products, markets, technologies and interests. They are chosen to organize and carry forward the needed industry cooperation for the creation of new value chains. Properly performing clusters can help to upgrade industrial practices, generate new knowledge and contribute to regional policy-making.

The partners of the DanuBioValNet agreed that phytopharma, Eco-Construction and bio-plastic/advanced packing (bio-based packaging) have a high potential for improvement of their respective value chains, and hemp is considered as a raw material suitable for all the three value chains. Project efforts are designed to allow partners to connect SMEs, farmers, universities, and research institutes within a value-added DanuBioValNet network. The partners intend to develop and implement a long-term, industry-driven roadmap for such collaboration along the entire value chain based on cluster partnerships for these processes. Focusing on the selected high potential sectors, and harnessing the nature of regional clusters within wider cross-regional selected value chains, DanuBioValNet will implement pilot actions, involving SMEs, universities, research institutions, policymakers, and civil society among others. The pilot actions serve as the prerequisite for creating a blueprint for cross-regional cooperation

Workshop „Eco-Construction – building with wood, recycling and reuse”

The workshop “Eco-Construction – building with wood, recycling and reuse” was part of the work package “Pilot action”. Its aim is to match related cluster actors in order to create eco-innovations along the selected value chains and to demonstrate three completed VCs that can be put in practice after the end of the project. The workshop was organized by Cleantech Cluster from Business Upper Austria and took place on the 13th and 14th of March 2019 in Linz, Austria, at the premises of Business Upper Austria, Tech center Linz.

The objective of this Pilot Action was to facilitate cross-border and cross-regional cooperation of clusters and SMEs for creation of a bio-based value chain. Major topics were the presentation of best practice examples from Austria for Eco-Construction, followed by a workshop on how to support and promote the use of wood and bio-based materials in construction projects within the Danube countries.

As the Cleantech Cluster also has a strong focus on activities and projects related to circular economy, the afternoon session was dedicated to recycling oriented dismantling with a special focus on reuse with best practice initiatives from Baukarussell Vienna.

The day finished with a guided tour with focus on innovative architecture and wood construction at the Paneum Asten near Linz. On the second day a guided tour was provided to the trade fair for craftsmanship in Wels.

Background

Bioeconomy aims at the transition of the economy from fossil resources towards renewable ones. Wood has always been an important resource for various purposes, material use as well as for energy production. In some countries the use of wood for construction has a long tradition.

The Eco-Construction industry in the Danube Region employs more than 1.2 million workforces and provides 26% of all related jobs in Europe. Furthermore, almost a quarter of all firms operating in this sector are based in the Danube Region (24%).¹

The question is how to prepare well established and rather traditional value chains like the processing of wood for future developments and challenges. The battle for skilled workers is already taking place in Europe and is also an issue for this particular business sector. Construction projects are getting more and more complex as digitalization makes it necessary to collaborate among different stakeholders already in the early planning phase.

The awareness of topics like climate change and the need to switch to sustainable and resource efficient ways of production and consumption is also approaching the construction business. Wood and bio-based insulation and construction materials have a good image in public and offer several ecological benefits. If life-cycle cost calculation is better integrated into big construction projects, then there will be also economic advantages when using wood instead of non-renewable materials.

Austria has both a strong forest sector (primary production, sawmills) and a well-established tradition in wood construction, at least in some parts of the country. Above that Austrian universities offer a good environment for research and innovation projects in close cooperation with companies. Architects consider wood in their planning activities more often. Besides, there are wood clusters in

¹ Cluster Mapping Synthesis Report Eco-Construction, DanuBioValNet, 2017

Austria that also focus on construction activities and support local SMEs in this sector. This was the reason to conduct this particular Pilot Action in Austria to show some of the best practice examples.

Participants

The workshop attracted 20 participants of different target groups from 6 countries (Table 1) on the first day (main workshop) and 11 participants on the second day (side event). The main target groups were cluster organizations and Business Support Organizations. Also universities were represented.

SMEs were reached though the presented cluster managers who will spread the results to respective SMEs in their countries. Unfortunately, it became difficult to reach SMEs directly. Several attempts were made to motivate Austrian as well as Eastern European companies (wood construction, wood processing, architects and recycling business). We send several invitations to all our partner companies (Cleantech Cluster: 147, Wood and Furniture Cluster: 210) and to our newsletter receiver (around 1000 contacts). It has to be stated that at least Austrian companies in this sector are not much export oriented, so at the moment they are not active in business opportunities to cooperate with stakeholders from Danube countries. This fact was also confirmed within our questionnaires that we sent to the companies. 4 out of 6 returned samples stated that the company was just doing business within Austria, for the other two samples we had a ratio of about 70-80% domestic market and 20-30% export market share. Export markets were mainly Germany and Italy.

Nevertheless there was a possibility to get in touch with Austrian companies on the second day during the trade fair for craftsmanship in Wels. The workshop participants taking part on this side event did use the opportunity for matchmaking.

| Country | Projects target group | | | | Other | Total per country |
|------------------------|---------------------------|---------------|----------|-----------------------------|------------------------|-------------------|
| | Regional public authority | Cluster / BSO | SMEs | Higher education & research | Non-profit association | |
| Austria | 1 | 1 | 1 | 1 | 1 | 5 |
| Bulgaria | | 3 | | | | 3 |
| Czech Rep. | | 4 | | | | 4 |
| Germany | | 1 | | | | 1 |
| Romania | | 4 | | | | 4 |
| Slovakia | | | | 3 | | 3 |
| Total per group | 1 | 13 | 1 | 4 | 1 | 20 |

Table 1: Participants of the workshop “Eco-Construction – building with wood, recycling and reuse”



Figure 1: Participants of the Eco-Construction Pilot Action in Linz at Business Upper Austria, 1st day workshop

Agenda

The results of the DanuBioValNet Eco-Construction Roadmapping workshop held on the 20th of April 2018 in Linz, Austria, were summarized in the Roadmapping report, which was the basis for the topics (gaps to close, joint future projects and activities) to be discussed at the Pilot Action event.

The keynote speeches were selected according to two most prominent gaps within the Eco-Construction value chain that can be overcome with the help of cluster organizations. We focused on:

- Architects & Technician collaboration – Showcase region Vorarlberg presented by Harald Gmeiner, Head of Ecological Building Division, Energieinstitut Vorarlberg
- Business & Academia collaboration – Computer-aided planning and production with systematized construction methods, Astrid Metzler, University of Innsbruck - Institute of Design and Materials Science, Department of Timber Construction as speaker.

After the keynote speeches the interactive workshop part took place. The participants were divided into two groups discussing the topics on how to promote and support Eco-Construction with wood in the Danube countries. Instruments used were brainstorming, discussion, visualization on the flipchart, summarizing, and presentation on the plenary to the whole audience. As the Cleantech Cluster is involved in circular economy projects, we also presented the Baukarussell Vienna initiative for recycling oriented dismantling with a special focus on reuse in construction business.

The side events were planned to show some best practice buildings and connect with local Austrian companies. On the first day the participants had the possibility to visit the Paneum Asten. The baking agent manufacturer Backaldrin in Asten built this modern customer information centre and event forum. The "Wunderkammer des Brotes", a free-floating, curved wooden construction with stainless steel shingles, is erected on a plinth building. It was planned by COOP HIMMELB(L)AU, which is a well known architectural office with subsidiaries in Vienna, Los Angeles, London and Melbourne.



Figure 2: Site visit to Paneum Asten, day 1

On the second day, a trip to the trade fair for craftsmanship in Wels was organized. A total of 180 exhibitors used this fair as a platform for cooperation to jointly promote innovations. The furniture and timber construction cluster of Business Upper Austria organized the FORUM INNOVATION as part of the fair. 16 innovative companies, start-ups, makers and researchers accepted the invitation and presented their innovations (e.g. 3D printing, robotics in wood construction).



Figure 3: Participants at the trade fair for craftsmanship in Wels including the Innovation forum for wood products and wood processing technologies, day 2

Group work

The participants were divided in two groups discussing the topics on how to promote and support Eco-Construction with wood in the Danube countries. The groups were moderated by Andrea Bruckner from Business Upper Austria and Olga Boyarintseva from BIOPRO Baden-Württemberg. It was intended to distinguish between the company and the cluster perspective for the respective groups, but as there were not many SMEs represented, we had quite similar starting points for each group.

Group 1 “Public awareness for wood construction from companies’ perspective”, discussion results:

Policy level

It was stated that it could be an option to address the Ministry for regional development in order to start pilot projects for wood construction with municipalities. A significant role of green public procurement was highlighted. On national level, it is still not that important in some countries so this leaves the possibility for improvement. On local level, it might be an option to also promote the use of local resources (wood). National and regional policy makers should be included in these activities.

Clusters and strategies

An important impulse could be inclusion of the topics of eco- and wood-construction in regional Smart Specialization Strategies as well as in national / regional Bioeconomy strategies. The cascading use of wood also fits into circular economy strategies as it is related to waste minimization. This could be a good basis for further funding opportunities if wood construction is represented there. Clusters may play an important role in developing and implementing these strategies.

Cooperation and innovation activities of companies

Participation in Horizon 2020 innovation and research projects should be pursued further. Also the cross-sectoral cooperation should be supported. In Danube countries, wood construction is not yet popular but in some of them a good tradition in furniture production exists. Austria could be an example for that since cooperation between the two sectors is well established there.

Science and research

It was discussed how to calculate the carbon storage effect of wood products and constructions. In some Eastern European countries there are already well-known laboratories for biomass testing. Also the collection of scientific data on wood mass flows (import / export / processing / use for energy, pulp and paper industry as well as further material use) is needed. In Austria this data is publicly available and provides an overview of the utilization paths of wood assortments from their application to their manifold uses.²

Other support organizations

The role of national and local energy agencies and consultants was mentioned to promote the use of wood in combination with energy efficiency (e.g. wooden passive houses). Also the organization of study tours and staff exchange could help to enhance the knowledge transfer within the Danube countries. The Austrian region of Vorarlberg is well-known for its special focus and implementation of eco-construction projects and the local Energy Institute even has experts coming from Japan to visit the buildings.



Figure 4: Group 1. Discussion on public awareness for wood construction from companies' perspective

² WOOD FLOWS IN AUSTRIA, Federal Ministry for Sustainability and Tourism (BMNT), 2018

Group 2 “Public awareness for wood construction from clusters’ perspective”, discussion results:

“Roots”

In order to promote wood construction, there should be a clear understanding why it is needed and what kind of benefits it brings people in comparison, for example, to construction with non-renewable materials. Clusters could shape a vision/mission to explain those needs to society.

Strategy and collaboration

The wood construction sector lacks regulations that set the legal framework, especially on the transnational level. Moreover, development of a unified common strategy for wood construction in the Danube region is needed. Political support is crucial with this regard, and the role of clusters in communication and negotiation with relevant authorities on different policy levels cannot be underestimated. Besides, clusters, as representatives of many SMEs, serve as a platform for business cooperation and networking.

Local opportunities

“Think globally, act locally” – this motto could also be applied to the wood construction sector. Business and ultimately the society benefit much more if using local than transported for many kilometers resources, be it biomass, labour forces or any other materials. In addition to this, the Danube countries should develop the wood construction relying on their own financial funds, so as the sector also invests in local economies.

Visibility and marketing

Raising public awareness is almost not possible without publicity. Clusters could be involved in organization of informational and “open” days for public to present and discuss advantages of the wood construction. Wood should be promoted in a way, so as society understands that implementation of this material is prestigious. Various presentations and promotion actions could be carried out in public places and visits to iconic wood construction sites could be organized for people. Benefits of construction with wood should be also highlighted in the media and commercials.



Figure 5: Group 2. Discussion on public awareness for wood construction from clusters’ perspective

Summary

How can the results from the Pilot Action potentially contribute to a more sustainable society?

Not only the topic of energy efficiency but also the sustainable use of materials is becoming more and more important. 50% of commodities consumption and 60% of waste production originate from the construction industry.³ It is necessary to rethink the whole construction process in order to minimize the negative effect on the environment. The further use of renewable insulation and construction materials could have a positive impact on resource efficiency within a region.

Due to the increasing demand for housing, the ongoing urbanization demands fast construction methods with low emissions. Architects, investors and politicians are therefore looking for solutions that create sustainable and flexible living space quickly and cost-effectively. Prefabricated room modules in timber construction offer flexibility, variability and favorable construction and operating costs, short construction time due to high prefabrication, easy dismantling due to detachable connections and high recyclability. The Austrian company Lukas Lang Building Technologies GmbH is specialized in this kind of modular timber construction and has already presented its projects on the DanuBioValNet Roadmapping workshop in Linz in April 2018.⁴

Besides, modern timber construction is becoming increasingly interesting for multi-storey buildings, especially residential buildings in the cities. The best practice example of LifeCycle Tower Dornbirn in Vorarlberg (8 floors) showed that it was possible to achieve 40% less building weight and 50% less primary energy („grey energy“) compared to a standard concrete building.⁵ Despite the comparatively higher raw material costs of wood, the LifeCycle Tower was only less than 3% more expensive than a conventional reinforced concrete building. It should be noted that this calculation is based purely on construction costs and not on operating or life cycle costs. In these areas, significant savings are achieved compared to a conventional reinforced concrete building.⁶

What kind of recommendations were given with respect to clusters/networks and their development towards bioeconomy?

Clusters could play an important role in bringing together companies for joint projects. They have a good overview on funding opportunities and support programs suitable for this target group. So, they could offer services to match the right partners and initiate project proposals with national / European funding. Also, as stated above, clusters could be involved in the development and implementation of regional / national Bioeconomy Strategy and Smart Specialization Strategy including this topics.

What kind of funding/alignment of funding was proposed during the Pilot Action?

Regional funding connected to Smart Specialization Strategies implementation, national funding connected to (national) Bioeconomy strategies, European Regional Development Fund.

What kind of follow up measures were suggested?

It was suggested to initiate follow up events for Eco-Construction with focus on:

³ Presentation Ecologisation of the local building industry - Energy Institute Vorarlberg, 13.03.2019

⁴ Company Website on <https://www.lukaslang.com/en/home/>

⁵ Presentation Ecologisation of the local building industry - Energy Institute Vorarlberg, 13.03.2019

⁶ LifeCycle Tower Energieeffizientes Holzhochhaus mit bis zu 20 Geschossen in Systembauweise, Bundesministerium für Verkehr, Innovation und Technologie, 2010

- ⇒ Wooden multi-storey buildings in urban areas (best practice examples with 6-storey residential houses in the cities of Graz and Wels as well as wooden skyscraper HoHo Vienna)
- ⇒ Wooden public buildings, e.g. community centers, kindergartens, in the region of Vorarlberg – implementing eco-construction for regional development towards resource efficiency

It would be possible to offer guided study tours for both topics in order to bring together architects, technicians and policy makers as well as construction developers to initiate further pilot projects in the Danube countries and facilitate knowledge transfer.