# newsletter

## From wisdom to value

Over ten years of real international networking, collaboration and dynamics of differences have created an evolving chain of forest-based pearls of WoodWisdom. WoodWisdom-Net has successfully combined the national and European strategies, priorities and programmes into an evolving chain of up to now four Joint Calls forming the WoodWisdom-Net Research Programme of 85 million € and 62 projects.



The ultimate leader and teambuilder of WoodWisdom Net, Ilmari Absetz has good experience as teamleader in the maritime environment as well.

ILMARI ABSETZ WoodWisdom-Net Coordinator MIKA KALLIO, WoodWisdom-Net Project Manager

The latest pearl in the chain is the WoodWisdom-Net+ Joint Call "Pacing innovation in the forest-based sector" including 23 projects with a total volume of 32 million  $\in$  covering four thematic research and innovation areas:

- Value-added products (10 projects)
- Industrial processes (7 projects)Competitive customer solutions
- (5 projects)

- Sustainable management of forest resources (1 project).

#### **Multiple impacts**

Following the impact assessment structures created in the ERA-LEARN 2020 project, WoodWisdom-Net is able to show multiple impacts both at project and network level. At the network level the impacts are focused on enduring connectivity. The retained collaboration since 2004, capacity building including development and improvement of capabilities and skills. For example attitudinal or cultural change such as reciprocal understanding and willingness to work together, conceptual impacts, influences on policy issues, and structural impacts of changes in institutions and structures in the national or European research landscape are recognized. WoodWisdom-Net has established and deepened the collaboration between research, companies stakeholders and funders.

Utilization of project results and their impacts are described in details in the project final reports (see WoodWisdom-Net website). A few examples in this newsletter issue demonstrate that at the project level the impacts are even wider, varying from science, innovation and economic impacts including basis of inter-



### WoodWisdom-Net

#### woodwisdom-NET+ In this edition:

- Achievements from six selected projects from four different themes in the WoodWisdom-Net+Joint Call
- The Forest-based SectorETP view on WW-Net
- Expectations and experiences from three funding agencies and the EU Commission
- Main results from WoodWisdom-Net+ monitoring survey

national harmonization and standardization, bioeconomy going towards circular economy, environmental, cultural and societal impacts especially sustainable development, climate change. Also first projects towards the societal perception of the forest-based sector are completed. Numerous organizational and training impacts are based on active participation of young scientists building up their competencies.

Already back in 2012 the external evaluators stated in their final comments:

"The creation of the WoodWisdom-Net Programme was a crucial step towards streamlining, strengthening, and enhancing the European Research Area in the forest-based sector. Research groups, the industry and funding organizations from the rest of Europe have become more active and have invested a significant effort in catching up with their (in the past much better organised) Scandinavian counterparts. The advantages of transnational collaboration were clearly presented by excellent research and development results, and in the establishment of cooperation among the funding institutions in the participating countries. A strong involvement of the industry was also a commendable achievement of the Programme, as was its contribution to standardization efforts on the European level."

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## The success of WoodWisdom-Net seen from The Forest-based Sector ETP



I have had the great pleasure to work closely with WoodWisdom-Net (WW-Net) and later WoodWisdom-Net+ since the very first funding call. If I am not mistaking, some 85 million Euro have been invested into more than 60 research & innvation projects during the calls of the WW-Net programme. The themes and topics have been based on national strategies but also the strategic topics of FTPs Strategic Research Agenda and the related National Research Agendas, which has proven to ensure a high level of committment from the sector and a strong industrial relevance to the research. In particular researchers and SMEs in the woodworking sector have appreciated the WW-Net projects.

The role of the Forest-based Sector Technology Platform (FTP) is to create opportunities for cooperative research and innovation in Europe and for this purpose, the WW-Net programme has been a crucial link between the EU-level and the national level.

The WW-Net programme have been

a great success, not the least because of the professional dedication of people like Ilmari Absetz and Mika Kallio but several other devoted individuals that I dont dare to mention now, afraid to forget someone – but you all know who you are!

At some critical moments, FTP have been able to help to convince the European Commission and, in some cases, Member States to allocate funding to the WW-Net programme. The history of excellence and strategic impact of WW-Net have then always been the best selling argument.

It is almost a bit emotional looking back at the "good old time" of WW-Net. However, looking forward, the Forest-Value ERA-NET Cofund programme will carry the torch of WW-Net, so we have every reason to be optimistic also for the future.

JOHAN ELVNERT Managing Director The Forest-based Sector ETP www.forestplatform.org

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#### What does the future hold

WoodWisdom-Net as a single network of its own has now come to an end but continues its activities under the H2020 ERA-NET Cofund Action "ForestValue Innovating forest-based bioeconomy" during the years 2017-2022. ForestValue builds on the success of three forestbased ERA-NETs: WoodWisdom-Net (2004-2017), SUMFOREST - Tackling the challenges in sustainable and multifunctional forestry through enhanced research coordination for policy decisions, 2014-2017 and FORESTERRA - Enhancing forest research in the Mediterranean through improved coordination and integration, 2012-2015. The overall objective of ForestValue is to promote increased innovation and competitiveness of the forest-based sector in Europe and support its transformation from a resource-intensive to a knowledge-intensive, productive, resource-efficient and resilient sector.

Already the first outcomes from Step 1 of the ForestValue Call 2017 (call for pre-proposals closed on 23 Jan 2018) show that the role and need for publicpublic partnerships still remains strong:

- Beyond the ForestValue consortium of 18 countries there are 17 partners from 8 countries (Belgium, Chile, Denmark, Estonia, Macedonia, The Netherlands, Portugal and Russia) present.
- Around 38 % of the applicants are representing universities and 28 % are coming from research organizations.
- The industry SMEs and large companies together - account to 30 % of all consortium partners.
- The majority (70 %) of the submitted pre-proposals include industrial partners, and all in all there are around 200 companies involved.

#### Thank you all

The authors wish to express sincere thanks to all WoodWisdom-Net partners projects and stakeholders for their commitment and overwhelming support throughout the years. We are looking forward to fruitful cooperation on new remarkable projects!

"Wood wisdom creates forest value to people and bioeconomy".



Mika Kallio has been the hands-on Project Manager for WoodWisdom-Net for a decade.

The following section gives a few examples from selected projects within the four different themes in the WoodWisdom-Net Joint Call 4.

#### **THEME 1 – Sustainable management of forest resources**

Impacts of faster growing forests of raw material properties with consideration of the potential effects of a changing climate on species choice (FASTFORESTS)

**Start:** 2014 **Duration:** 36 months **Total budget:** € 797,087

#### **Project Coordinator:**



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The intensification in present forestry, the challenges connected to declined timber quality and negative perceptions among the public has been the major themes within this project.

The intensification of forest management offers a potential solution to the foreseen increase in demand for timber. But this intensification is not without its problems: these include a perceived decline in timber quality and negative perceptions among the public. This project focused on two forest tree species: Sitka spruce, the mainstay of Irish forestry, and Douglas fir which is a potential alternative candidate species for Norway spruce in the context of climate change in the three partner-countries.

#### **Utilisation of results**

Intensifying forest management practices has been a major cause of conflict in the past; any further intensification is likely to lead to further conflict. The study indicates practices that will be social acceptable if more timber is to be produced from existing forests. However, it has also shown that many of the practices being considered are not acceptable. Other means of producing more wood from existing forests need to be identified; e.g. the use of mixed species/age stands managed under alternatives to the clearfell system need to be investigated further. At the same time, there is a need for better communication among all stakeholder groups so that, amongst other things, a better understanding of why certain practices are being adopted can be obtained.

A new model describing the growth of Douglas fir was developed in France. This will be further developed. New knowledge generated in Ireland and Germany will be explored further before being transferring the results into practice. Interim results are transferred to the industry via seminars and local workshops. Recommendations for changes in practices are also via seminars directed towards the industry and research updates and information notes distributed through professional associations.

This project has fostered the development of research links among the partners that did not exist before the project started. These links are likely to continue as the partners share common research aims in their research goals and interests.

The intensification in present forestry, the challenges connected to declined timber quality and negative perceptions among the public has been the major themes within this project.

#### **THEME 2 – Industrial processes**

## Value added by optimal wood raw material allocation & processing (VARMA)

**Start:** 2014 **Duration:** 36 months **Total budget:** € 1,507,345

#### **Project Coordinator:**



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#### **Project Partners:**

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Figure. The principle idea of Wood Allocation Centre (WAC) concept

In order to foster growth and competitive advantage of the sawmill industry, creative and effective ways to meet increasing customer demands are needed. The wood supply chains should link forest resources, logistics and tree bucking according to the sawmill orders better than it is today. The VARMA project aimed to bring new knowledge on the issue, approaching the wood supply chain optimization from four different angles in Finland, France, Germany and the United Kingdom.

The transnational VARMA research project investigated technical and business considerations of a wood allocation centre (WAC), defined as: A virtual or real structure (facility or organization) that boosts efficiency of wood raw material supply by centralizing resources, operations and services for actors in the wood supply chain (network). An important aspect of the WAC concept is that centralized wood allocation can direct the available wood to the most suitable customers, with the highest possible value added.

#### **Utilisation of results**

The key results are reported in project reports and scientific publications. In France, the optimization software is already used by one sawmill and its use in others sawmills from SELECTION VOSGES and others will be discussed. There are plans to industrialize the software and add function such as logistic database. In Finland, the optimization tool will be demonstrated to the industry and further development collaboration will be discussed with software developers. In Germany, collaboration with regional partners will be continued.

Furthermore, initiatives have been launched regarding to mobilizing forestry cooperatives and task forces of forestry companies and haulers to identify service pooling options and structures. The results have been and are being integrated in research and academia, e.g. at Eberswalde University for Sustainable Development, Erfurt University of Applied Sciences, Wildau Technical University of Applied Sciences, and Otto von Guericke University Magdeburg. The UK needs to be more adaptive to change management in the way the project is dealing with the data, and how this is used to better understand the resource.

What is required is wider engagement of industry partners at early stages of new developments. More integrated approach to combine and share datasets would potentially give more opportunities for an easier transition to use new developed ideas and techniques.

#### THEME 2 – Industrial processes

## Innovative lean processes and cooperation models for planning, production and maintenance of urban timber buildings (leanWOOD)

**Start:** 2014 **Duration:** 36 months **Total budget:** € 1,356,343

#### **Project Coordinator:**



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Modern timber architecture is associated with the industrialized production of construction elements that involve a high level of prefabrication. Specialist knowledge of timber construction and its production facilities is missing in early planning stages, especially in the case of multi-storey buildings, because timber manufacturers' and/or timber construction engineers' involvement in projects happens too late within the process. Significant expenses are incurred if a project stage is late and results in a "re-design phase". This will often cause missed deadlines and eventual cost overrun. Best conditions are given if future building projects are planned right from the start by a team of architects, engineers and timber construction specialists working together.

Against this background, a consortium of 5 research partners from 4 different countries and their respective practice partners was established, to examine this problem and to develop proposals for solutions. On the basis of numerous interviews with representatives from practice and scientific research, the national framework conditions were analysed and compared. In summary, the background of the involved partners with regards to building culture and building procedures is very different. This is apparent in procurement processes and cooperation models (e.g. different public process procedures) as well as in building law (e.g. fire protection, sound protection, ecology).

#### **Utilization of results**

The project identified several measures that suit different requirements and different clients. These were all collected into one toolbox.

The results are available in the form of publications, except for the

specification sheet, which will be available as a free web application. The results should be understood and used as a decision-making aid for all parties involved in the building process to support and further develop methods of prefabricated timber construction.

In Germany and Switzerland, a publication with basic knowledge on the subject and treatment recommendations will be developed, which will provide arguments for legislators and decisionmakers to initiate change in processes in the areas of procurement law, fee structures and building regulations. The aim is to reduce obstacles in deciding for the use of prefabricated wooden structures.

The Finnish book shows the strengths and potential of timber construction by studying a SWOT analysis in an increasingly politically desired ecological environment. It discusses the advantages of standardisation, resource efficiency and new planning methods like BIM (Building Information Modelling) for a lean construction and planning process.

France (FCBA) opted to invest in training capacity. With training sessions, the "lean" subject can be covered according to the French timber industry's demands. Also, FCBA will create a guide to successfully implement lean in construction and move from theory to practice.

## THEME 3 – Value added products Hybrid cross laminated timberplates (HCLTP)

**Start:** March 2014 **Duration:** 35 months **Total budget:** € 831,000

#### **Project Coordinator:**



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The project focused on developing, optimising, producing and testing new, upgraded types of cross laminated timber plates. The plates were to be supported with a production line. The new plates, so called hybrid crosslam plates, would be optimised in terms of material use, production cost and other specific conditions (spans, fire resistance, seismic design, outer climate etc.) that would allow for their more effective and economic use. As the quantity of yearly cut timber in Europe is slowly reaching its maximum, its price is consequently rising, making conventional Xlam less competitive on the market on one hand and more straining on the forest of the other. A consortium of seven partners from three European countries, both from the academic and industry sector, was established to fulfil the task.

#### **Utilisation of results**

New, upgraded types of cross laminated timber plates were developed, using a ribbed concept. It allows for a 30-50 % material reduction at the same load carrying capacity, a higher fire safety and better acoustic performance. It also reduces the cost of the outer envelope as it eliminates the need for a façade substructure. The experimental behaviour shows the new plates fail in a more ductile manner, hardly seen in timber



Photo showing the lamella in the ribbed Xlam plates after tough testing conditions. Gradual damage accumulation with two ribs failed, one remaining.

structures and demonstrate a higher wall vertical resistance and more controlled buckling behaviour with a 30 % material reduction. The developed production line is capable of yearly producing 300 thousand square meters of ribbed plates in three shifts. The new product is ready to be implemented into production.

Talks with the industry to establish a production for the new ribbed elements started even before the project was finished. Several existing cross laminated timber producers are interested in the product hence it is expected that the product will be available on



One of the ribbed timber-concrete specimens

the market in a couple of years.

The ribbed cross laminated plates are protected with a patent. The project also resulted in one diploma work and one master thesis. A prototype press was made during the project and a new production line process was developed. The project products were developed to a high technology readiness level, enabling their market implementation in the near future. As the results show, the new product performs substantially better than its conventional counterpart, it has the potential to gain a large market share.

## THEME 4 – Competitive customer solutions What We Wood Believe – Societal Perceptions of the Forest-based Sector (W<sup>3</sup>B)

Start: May 2014
Duration: 30 months until October 2016
Total budget: € 737,790

#### **Project Coordinator:**



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The objective of the W3B project was to create and demonstrate innovative and cost-efficient ways for communicating towards stakeholders the relevance of the European forest-based sector and its products for a sustainable bio-economy.

Therefore, the project mapped the state of communication by analysing the website content of 80 companies and industry associations with a focus on eight "core topics of interest" (TOI) formulated at an international stakeholder meeting. The most commonly communicated topic was Forests and economy (FEC), particularly within large companies and especially in Finland and Austria. Instead, Added Value (AVA) was emphasized especially within family businesses and SMEs operating in Slovenia. In comparison, the least emphasized topics were Woodbased innovations (WBI) and Forest ecosystem services (FES).

#### **Utilisation of results**

The general public lacks interest in certain forest-based sector related topics. They do not actively inform themselves about wood supply or forest management practices. To communicate these topics, the project advises to provide this information at a point of emotional activation.

Overall, the project contributed to an improved understanding of communication mechanisms in the forest-based sector. The results were wrapped up in the Major Project Results Report (available online via ResearchGate) and Good Guidance Report (available online via WoodWisdom-Net website), of which the latter is in particular for practitioners.

During the project five stakeholder workshops were organised to transfer results to relevant stakeholders and also incorporate their feedback in the project progress. Especially the final stakeholder workshop in September 2016 in Brussels was very well attended by relevant stakeholders.

Following recommendations derived from the project, they are aimed to guide future communication activities towards the general public:

- Acknowledge basic communication principles
- Rethink your content
- Appeal on the emotional side
- Communicate coherent messages



The experiments showed, that when being exposed to tailored information forest visitors attitudes transform from ecological concerns and negative visual perception towards economic considerations

- Some topics are strongly perceived, others are not
- People without forest-based sector connection need attention
- Use words that are easily understood
- Provide information at the right moment

#### THEME 4 – Competitive customer solutions

## Silent Timber Build for The European Market (Silent Timber Build)

**Start:** August 2015 **Duration:** 36 months **Total budget:** € 2,008,000

#### **Project Coordinator:**



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#### **Project Partners:**

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Sound insulation and vibration characteristics of buildings represent the design parameters always deciding the structural dimensions and build-up of the floor- and wall assemblies in a building, no matter what the structural material is. It is not the statics, not the fire regulations, not energy requirements or any other technical aspect, it is always the sound insulation and / or the vibration characteristics that state the dimensions, at least for multi-family houses where requirements adapted to subjective evaluation are effectual. As soon as the design criteria of sound insulation and vibration are fulfilled, then the predicted sound insulation and vibration are expected to be satisfactory, e.g. the main structural dimensions in the building should then be decided since they are normally big enough to cover the needs for other technical aspects. This is at least valid for normal high rise multifamily buildings.

Therefore, the results from this research project is of vital importance for the further development of wooden structures. Calculating and optimizing the structural components will imply further development of wood in buildings and make the production reduce in cost. The project results comprise a design guide involving for separate reports (broadcasted in September 2017 during the WoodRise conference in Bordeaux). Together they provide an extensive description of possibilities to facilitate prediction of and optimization of the sound insulation characteristics concerning floor and wall assemblies comprising wood as bearing structural element.

#### **Utilisation of results**

Using the results from the project, modelling and prediction of wooden structures is far more easily accessible and more precise today. A software was developed further (SEAWOOD) allowing any wooden structure to be modelled. A big improvement was done regarding the sound source and the description of the forces operating on wooden structures. A grouping was done considering the most *"sensitive prediction"* in terms of annoyance – impact sound of floor

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assemblies. The grouping facilitates comparisons of the modelled results with "measured" values for the actual floor assembly increasing the safety margins and the confidence of the engineer. Floor assemblies can be connected to an aural impression for better understanding of the numbers using the online listening tool hosted by Lignum.

The software SEAWOOD is not yet a "*simple*" tool for any engineer, but the software is a powerful tool in the design process and available for advanced computing. Together with the previous work within the COST action FP 0702 the input and knowledge for a general engineering software is coming close.

The cooperation with the parallel WoodWisdom-Net+ project "*HCLTP*" was of great benefit since the project was able to model a structural element that is tested and developed based on its load bearing capacities and production abilities. Some basic changes were proposed from Silent Timber Build in order to optimize it also in terms of acoustics, still not to worsen other technical characteristics.

The project published a "Design Guide" (available online: https://www. hankeportaali.fi/assets/files/uploads/74. pdf) including summary information on 1) The modelling prerequisites and the software used, 2) The verification of models and the grouping that has done in order to simply model verification, and 3) The ATLAS (a European online atlas with various floor and wall assemblies, partly developed within Silent Timber Build) and the basic principles for the auralization tool (available online at www.lignum.ch).

## Slovenia in ERA-Net Plus WoodWisdom-Net+



Slovenia is the 3rd most forested country in Europe. 1,2 million hectares of forests are covering 62% of the country. According to this means that Slovenia has a great potential in forestry and wood sector.

The main challenge of the Slovenian forest industry in last decades has been too much focus on the export of raw wood materials and not sufficiently inclusion of the whole forest- and wood value chain. The lack of cooperation between research institutions and industry has also hampered the development and competitiveness of the forest sector. So WoodWisdom-Net+ offered a great opportunity for Slovenian forest sector, for both researchers and industry to cooperate between themselves and also in European Research Area (ERA).

The Ministry for Education, Science and Sport, Slovenia (MIZS) recognized the opportunities that Slovenian researchers and industrial partners in forestry and wood sector can exploit for their development and progress and also how much they alone can contribute to the European Research Area as part of their collaborations in ERA-NET projects. Therefore, MIZS got involved in co-funding the WoodWisdom-Net+ Joint Call, and eventually was able to support Slovenian partners in 6 projects selected for funding (most of them were public research institutions and one SME). During the lifetime of WoodWisdom-Net+ MIZS also actively joined another ERA-NET project from the forestry field – Sumforest – and actively contributed to the preparation of the ERA-NET Cofund Forest Value, which is currently running and is developed on the basis of three previous ERA-NETs from the forestry field: WoodWisdom-Net, Sumforest and Foresterra.

Success of Slovenian partners in transnational consortiums actually highly motivated Slovenian researchers and industrial partners in their fundamental research and development and also confirmed their potential and professional competences. It created stimulative international research environement and it also made a significant contribution to further integration under various different European programs, supporting research and development (Horizon 2020, ERA NET Cofund), were 33 pre-proposals projects including Slovenian partners, what places Slovenia among the countries with most applications. It also shows vivid activities in forestry sector for both researchers and industry and especially increased cooperation between researchers and industry. We can say that for this current situation, the participation of Slovenian researchers and industry in the WoodWisdom Net+ and in some other initiatives in the forest sector is essential.

The expectations of Slovenian researchers, industry and funders participating in WoodWisdom Net+ are at the end of the project fulfilled. The high number of Slovenian partners among pre-proposal projects is increasing (e.g. ForestValue Joint Call 2017) and even shows that more co-funding from the MIZS would be welcome both for researchers and industry partners. ERA-NET Action WoodWisdom-Net+ definitely showed that the Slovenian research and industry partners are willing to participate in international collaborations of high quality consortiums and aiming to implement

competative, innovative and high value added transnational projects.

MIZS has participated in many ERA-NETs under FP6, FP7 and Horizon2020 as co-funder. According to succesful cooperations in various fields of research and industry MIZS is willing to participate in future ERA-NET Actions, too. At the moment the question is if and how these transnational projects will be placed in FP9.

#### KATJA CEGLAR

Ministry of Education, Science and Sport, Slovenia

## Are the aims and targets of WoodWisdom-Net+ achieved?

The WoodWisdom-Net+ is finished and had its final conference in Edinburgh in April 2017. All final reports have now been successfully finished. However, the funding organisations want to learn more about success and failure within the research networking in order to be even more targeted in future cooperation. A monitoring survey was therefore performed last year among the project participants of the RDI projects funded under WoodWisdom-Net+.

The aim of the online survey was to get an impression to what extent some of the main targets of the call were achieved and how different aspects of research were evaluated. Furthermore, the answers should allow to address more adequately the needs of the community in possible future calls. A particular view was taken on the market implementation as a result of the research in different projects.

The survey consisted of three parts:

- Organisational aspects and ERA-NET activities
- Knowledge exchange and transfer
- Research, technology and economical value

#### Respondents

The upper expectation to responses from 23 projects and three project members was 69 answers. Finally, there were 33 respondents from 15 projects, i.e. the response rate was around 50%. Most responses were from academia (26) and the rest (7) from economic partners.

#### **Organisational aspects**

From an organizational point of view the national funding agencies did fulfil the needs and expectation of the applicants. Almost 80% expressed to be very satisfied or satisfied with the support received (Fig 1).



Figure 1: How well did your national funding agency fulfil your needs and expectations in the administration of your project?

There were also several suggestions for improvement with regard to organizational issues, like more knowledge exchange between different project and groups. Related to this, participants asked for more platforms, e.g. with a chat opportunity or workshops to get in touch with each other. In summary the project participants would have desired from an organizational point of view more workshops and a better coordination of national and international submission requirements and clear indication of "no-go" topics.

#### Knowledge exchange and transfer

The participants were asked about how they valued the different benefits provided by their transnational projects with regard to the implementation and access to knowledge. The range of answers from industry and research partners concerning implementation followed the same pattern with a majority of excellent and good in the judging (Fig. 2). In a very positive overall picture, 85% of all partners valued their benefit on implementation activities as good or excellent. The access to new intellectual property or exploitation of IPR had somewhat lower scores than the other criteria, especially among the research partners.

With regard to access to knowledge, 90% of all respondents (research partners and partners from industry together) valued the three topics "new relationships with research partner", "strengthening of R&D competencies" and "knowhow build-up" as very high or high. Partners from industry or service companies rate the three topics even more positive than partners from research. 95% of all respondents from a service or research company value the three topics related to access to knowledge as very high or high whereas this is the case for 89% of the partners from research. The individual statement of one respondent says that the project was a wonderful opportunity to strengthen academic relationships and contacts with industry, which reflects well what the project participants have experienced with regard to the knowledge exchange and transfer.



#### Implementation- Answers from research partners

Figure 2. Now that your project is finished, how do you value the following benefits provided by the transnational project with regard to the implementation? Answers from research partners.

### Research, technology and economical value

If participants were asked what was the present outcome of their project they mostly stated that they have additional knowledge gained, mainly due to the international cooperation. The gain of knowledge was achieved in different fields, some respondents say that they have got a better understanding of technology while others say that they learnt a lot about international project management. Others strengthen the better understanding of different processes. Up to 40% of the projects stated that a demo or a pilot plant was planned as a result of the project. This must be said to be a high number taking into account the variety of projects and even the basic arrangement of some of the projects.

Both the research and the business community were asked to estimate the impact of the projects on business development. As can be seen from Fig. 3 only some 30% evaluated the effect as high. That means that 70% estimated the effect as moderate to low concerning the effect on the business development.

Despite a not very high commitment

on the expected business development, about 64% of all respondents are planning a market implementation of the results within the next 12 to 36 months. The respondents agreed in general on the fact that the major profits of the projects are more efficient processes, a better market position and faster market implementation. The aspect of better international market development is especially crucial for respondents from industry or service companies.

#### Main lessons learnt

This monitoring survey shows a general high satisfaction with the organisation of the call and its results. Still, there is room for improvement, e.g. reduce the reporting burden, streamlining and securing a better information to all participants in all countries. A higher prioritization and statement of 'no-go topics' could have been done and more attention should be given on access to new intellectual properties.

Even if the number of respondents for the monitoring survey represented only about 50% of the expected participants (but respondents of 15 (65%) out of the 23 projects), the results gives an indication on some important aspects to be further developed. A relatively large amount of the respondents valued the outcome of the projects as fair or moderate, with however 50% of the respondents rating the outcome on more efficient processes as high. Nevertheless, the outcome of the project and expected business development is one aspect that should be critically analysed in order to improve beneficial effects in future co-operative ERA-NET calls.

The full report on the survey of the WoodWisdom Net+ call can be found on the WoodWisdom Net webpage:

#### ALAIN DIETRICH

Innosuisse – Swiss Innovation Agency

#### ANNE SCHERTENLEIB CTI

PETTER NILSEN The Research Council of Norway



Figure 3: Could you please estimate the level of concrete impact of the project on the business development of your company? Left hand side responses from research partners, right hand side responses from industrial partners.

## Vinnova, Sweden and WoodWisdom-Net



Vinnova is one of the funding organisations which have been involved in the WoodWisdom-Net ERA-NET actions programmes from the very beginning. Joint programme activities have even an earlier history in Scandinavia, as the joint programme Nordic Wood started in 1984 with a model rather similar to the ERA-NET scheme. National funding agencies, together with research organisations and industries funded joint research projects with partners from at least two countries with a top up funding from The Nordic Council. Vinnova has prioritised international collaborations and has been able to match large national forest industrial programmes with different programmes in the European Research Programmes as ERA-Nets. As the WoodWisdom-Net I, II and WoodWisdom-Net+ have been such a success with several attractive and innovative projects/consortia, it was never a question of whether or not to participate in the follow-up ERA-NET Cofund Action ForestValue. Vinnova has considered its participation in ERA-NETs important due to the following reasons:

• Joint forces – public funding with industrial input deliver synergies and especially critical mass to achieve more effective results from research for implementation.

• Access to frontline research and knowledge to other countries, both research organisations and industries.

• Forest industries are no longer national, they operate on an international market and are often part of international companies.

• Fantastic opportunities for broadening national research programmes through international co-operations.

• Not to forget the excellent work and coordination of the WoodWisdom-Net staff and partners, which make an amazing credit not only to WoodWisdom-Net but also ERA-NET scheme as a hole.

• ERA-NET+, which means a topping-up funding from the EU with 1/3 compared to public funding, made it possible for WW-Net+ to include some additional consortia in the portfolia of funded ones, when available national funding from some partners had come to an end.

#### EVA ESPING

Vinnova – The Swedish Governmental Agency For Innovation Systems

## Stakeholder view from the European Commission



From my point of view, WoodWisdom-Net has managed to build a strong community in the forest-based industry sector, which has consistently delivered high quality programmes and provided resources for Research and Innovation projects in the sector. The work done in the WoodWisdom-Net calls has given tremendous momentum to research and innovation in the forest-based sector and contributes to underpin the European biobased economy. The resources provided by the WoodWisdom-Net calls have been valuable for the stakeholders in the sector and have complemented well the support provided by the European Research and Innovation Framework Programmes to the European forest-based industry. In this respect, I believe WoodWisdom-Net has been an effective model to stimulate research and innovation by leveraging public funding, at the European and national level, with private funding.

In addition, from my experience in WoodWisdom-Net+, I can say that this project has been a success in pulling together resources to maximise impact for the forest based sector at the European level. A clear example has been the transnational call launched in WoodWisdom-Net+, where some of the consortium partners, in order to maximise the number of projects to be funded, have decided to give part of the European contribution to which they could have potentially been entitled to other beneficiaries. This has allowed launching a larger number of project, maximising the impact of the call and the technological progress to benefit the European forest-based industry sector.

CARMINE MARZANO Research Programme Officer European Commission DG Research & Innovation, D2

## The UK involvement in WoodWisdom-Net

As a founder member of the very first WoodWisdom-Net initiative, the UK saw this as the most cost effective way of undertaking important research into improving the way in which wood is utilised. We expected that not all of our interests would be addressed, and had some concerns about the way in which the funding was to be deployed.

However it became clear from early on that this was genuine partnership, with each partner having an equal say in how the initiative developed. This, we feel, is one of the main reasons for the enduring success of WoodWisdom-Net. The initiative has brought industry and academia together to solve problems of joint interest, and deliver new and innovative solutions to the uses to which wood can be put. The WoodWisdom-Net partners have developed strong and trusting relationships over the years, and the successful delivery of many projects has encouraged others to join in each successive research call. The UK has jointly funded around ten projects over the life of WoodWisdom-Net, and these have added greatly to our understanding of the way in which UK timber is and can be used. This has been helpful in the construction sector, where historic concerns over fire and longevity have hindered greater use of timber in housing. However, as part of the partnership we have also had access to the results of all of the other projects. This knowledge base would have been way beyond our ability and resources to generate ourselves, and easily justifies the work required to deliver the initiative. We have benefitted from new UK entrants to the forestry research sector, who have brought new ideas and different perspectives to the sector. Companies have engaged with research at a commissioning level, which eases the process of adoption and change, thus increasing the impact of science and improving value for money.



The article author Roger Coppock (left) - together with Ilmary Absetz and Mika Kallio.

With national budgets across Europe under immense pressure, collaboration has to be the way forward for research projects of scale, and the forest-based ERA-NET+ has proved a highly effective way of doing this. The ERA-NET+ will continue to provide excellent leverage for national resources, a forum for international scientists to share ideas and experiences, and innovation to support the ongoing development of the European forestry sector as it responds to new demands and market opportunities.

ROGER COPPOCK Forestry Commission, Edinburgh

## List of all funded WoodWisdom-Net projects

#### **JOINT CALL 1:**

- 1. BioPack Design of biocomposites based on nanocellulose and hemicelluloses for future packaging materials
- 2. **DesignCell** Designed Cellulosic Nanostructures
- 3. FibreSurf New Biotechnical tools for wood fibre modification and analyses
- 4. **FUNFIREBIC** Functional fibre reinforced biocomposites
- 5. HemiPop Engineering structure and properties of poplar hemicelluloses
- 6. PROBARK A sustainable process for production of green chemicals from softwood bark
- 7. ReCell Refined cellulose derivatives for high-value biomedical products
- 8. WoodFibre3D Structure-property relations of wood fibres: 3D characterization and modelling
- 9. FireInTimber Fire resistance of Innovative Timber structures
- 10. GRADEWOOD Grading of timber for engineering wood products
- 11. **Improved Moisture** Improved glued wood modelling and mitigation of moisture-induced stresses WinFur Use of furfurylated wood for the production of high-performance windows made of European timbers
- 12. TES-Energy Facade Timber-based element systems for improving the energy efficiency of the building envelope
- 13. WinFur Use of furfurylated wood for the production of high-performance windows made of European timbers
- 14. WoodExter Service life and performance of exterior wood above ground
- 15. **IRIS** New technologies to Optimize the wood information basis for forest industries developing an integrated information system
- 16. WOODVALUE Value creation in wood supply chains
- 17. WOVEN Wood formation under varying environmental conditions

#### **JOINT CALL 2:**

- 1. Acuwood Acoustics in wooden buildings
- 2. ECO2 Wood in carbon efficient construction
- 3. smartTES Innovation in timber construction for the modernisation of the building envelope
- 4. Lilo High Impact Lignin-Cellulose-Composites for Logistics Development of advanced lignin-cellulose-composites with high impact properties for modular pallets and components for transport systems
- 5. **MouldPulp** Development of Durable, Fully Bio-Based Thermoplastic Composites from Bioplastics and Pulp Fibres for Injection Moulding Applications
- 6. CTPro New forest industry production systems based on high-speed CT scanning
- 7. HI-FRETECH High-frequency impregnation of wood
- 8. WoodSens Knowledge-based processing of wood-based panels for better products quality and safety
- 9. **DEMOWOOD** Optimisation of material recycling and energy recovery from waste and demolition wood in different value chains

#### JOINT CALL 3 (JOINTLY WITH ERA-NET BIOENERGY):

- 1. **AgroCop** Maximizing Timber and Energy Wood Production by Innovative Agroforestry Systems with Short Rotation Coppice as Intercrop
- 2. BIOFOAMBARK Bark Valorization into insulating Foams and Bioenergy
- 3. **COOL** COMPETING USES OF FOREST LAND The future of integrative and segregative policy and forest management approaches in Europe

- 4. RegioPower A regional IT-based platform for bringing resource needs and land-based resource production together
- 5. **WOP** WoodSupply
- 6. Cell-Assembly Self-Assembled Biomimetic Wood-Based Nanocomposites
- 7. LBTGC Load Bearing Timber-Glass Composite Structures
- 8. PowerBonds Enhancement of Fiber and Bond Strength Properties for Creating Added Value in Paper Products
- 9. WOBAMA Wood Based Materials and Fuels
- 10. **WoodApps** Improvement in collaboration along the wood value chain through knowledge-based methods and mobile applications
- 11. **GREASE** A novel lipid platform to sustainable bio-based products from low-value forestry streams through multi-functional fatty acids
- 12. **PINOBIO** Pinosylvins as novel Bioactive Agents for Food Applications
- 13. ProLignin High-value products from lignin side-steams of modern Biorefineries

#### **JOINT CALL 4:**

- 1. **FASTFORESTS** Impacts of faster growing forests on raw material properties with consideration of the potential effects of a changing climate on species choice
- 2. BIOCOPOL Enhancing wood durability and physical properties through innovative bio-based sustainable treatments
- 3. **CaReWood** Cascading recovered wood
- 4. COSEPA Controlled separation and conversion processes for wood hemicelluloses
- 5. EU Hardwoods European hardwoods for the building sector
- 6. **leanWood** Innovative lean processes and cooperation models for planning, production and maintenance of urban timber buildings
- 7. ReWoBioRef Mobilisation and utilization of recycled wood for ligno-cellulosic bio-refinery processes
- 8. VARMA Value added by optimal wood raw material allocation and processing
- 9. AEROWOOD Wood-based aerogels
- 10. PShapes Polysaccharide bioshapes chemical design and shaping into new biomaterials
- 11. COMPAC Plasticized lignocellulose composites for packaging materials
- 12. **CreoSub** New protection technology to substitute creosote for the protection of railway sleepers, timber bridges and utility poles
- 13. HCLTP Hybrid cross laminated timber plates
- 14. **HEMICELL** Wood based chemicals, in particular chemical modified hemicellulose, used as functional additives to enhance the material properties of cellulose esters
- 15. LIGNOHTL Liquid fuels from lignin by hydrothermal liquefaction and deoxygenetion
- 16. PRONANOCELL processes for nanocellulose composite manufacturing
- 17. TunableFilms Tunable lignocellulose-based responsive films
- 18. WoTIM Wood-based thermal insulation materials
- 19. **DuraTB** Durable timber bridges
- 20. Silent Timber Build Silent timber buildings for the European market
- 21. TallFacades Tall timber facades, identification of cost-effective and resilient envelopes for wood constructions
- 22. W3B Wood Believe Social perceptions of the forest-based sector and its products towards sustainable society
- 23. Wood2New Competitive wood based interior materials and systems for modern wood construction

## Partner organisations of WoodWisdom-Net+

#### **Finland**

- Business Finland (Business Innovation Agency Business Finland (as of January 1, 2018 Finpro the Finnish trade promotion organization and Tekes the Finnish Funding Agency for Innovation united as Business Finland). https://www.businessfinland.fi/
- Academy of Finland (AKA). www.aka.fi
- Ministry of Agriculture and Forestry (MMM). www.mmm.fi

#### Sweden

- VINNOVA Swedish Governmental Agency for Innovation Systems. www.vinnova.se
- Statens Energimyndighet (SWEA). www.swedishenergyagency.se

#### Norway

- RCN - The Research Council of Norway. www.rcn.no

#### Germany

- Fachagentur Nachwachsende Rohstoffe e.V. (FNR). www.fnr.de

#### France

- Ministere de l'Agriculture de l'Alimentation de la Peche et de la Ruralité - Direction Générale des Politiques Agricole, Agroalimentaire et des Territoires (MAAF). www.agriculture.gouv.fr
- Institut Technologique FCBA. www.fcba.fr
- Institut National de la Recherche Agronomique (INRA). www.inra.fr
- Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME). www.ademe.fr

#### Latvia

- Ministry of Agriculture of the Republic of Latvia (ZM). www.zm.gov.lv
- Latvian Academy of Sciences (LAS). www.lza.lv

#### Austria

- Federal Ministry of Sustainability and Tourism (BMNT), (as of January 8, 2018 the Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW) has become the Federal Ministry of Sustainability and Tourism). www.bmnt.gv.at/

#### Switzerland

- Innosuisse Swiss Innovation Agency (Innosuisse), (as of January 2, 2018 Innosuisse took over the functions of the CTI). www.innosuisse.ch
- Federal Department for Environment, Transports, Energy and Communication (BAFU). www.bafu.admin.ch

#### **Slovenia**

- Ministry of Education, Science and Sport (MIZS). www.mizks.gov.si

#### **United Kingdom**

- The Forestry Commissioners (FC). www.forestry.gov.uk

#### Ireland

- Department of Agriculture, Food and the Marine (DAFM-COFORD). www.agriculture.gov.ie

#### Slovakia

- Ministry of Agriculture and Rural Development of the Slovak Republic (MPRV SR). www.land.gov.sk

Project website: www.woodwisdom.net

### WoodWisdom-Net

### Main activities

• The overall objective of the WoodWisdom-Net+ is to support the transformation of the European F-BI and sustainable forest management for increasing resource efficiency and adapting to and mitigating climate change effects.

• The aim is to plan a single joint call for proposal for research, development and innovation in the forest sector with a clear financial commitment from the participating national (or regional) research programmes and the EU.

• The estimated total funding volume of the joint call is expected to ca. 30 MEUR (share of industry funding 5-10 MEUR).

• The main approach in the WW-Net+ is the substitution of non-renewable resources (e.g. materials or fossil fuels), by renewable forest-based solutions to reduce carbon emissions and waste.

• Looking to the future, the WW-Net+ will continue to improve the delivery of joint activities and has ambitious goals for funding trans-national research and offering access to the resources of other countries.

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