

# newsletter



WoodWisdom-Net

## WoodWisdom-Net – Present status and future perspectives

The ambitious overall objective of WoodWisdom-Net as an active Era-Net is to promote the transformation of the European forest-based industry from resource-intensive to value added knowledge-intensive, innovative and globally competitive industry based on sustainable use of renewable raw materials.

The growth path of WoodWisdom-Net leads to creating and establishing a common research, development and innovation funding platform for long-lasting cooperation. The added value of transnational concrete cooperation is the opportunity to easily access international know-how, to gain technology and market expertise and to integrate into international forest industry value chains. The past, present and future joint calls form a transnational evolving program to cover the whole innovation chain from science to business.

The 17 consortia projects of the 1<sup>st</sup> joint call of 2007 to 2010 WoodWisdom-Net have ended with a closing seminar of WoodWisdom-Net Program in Paris in February. The main results of all projects are made into a joint program report and published soon. The impact and value added of transnational collaboration will be evaluated with a focused expert evaluation.

The 2<sup>nd</sup> call “Sustainable, competitive processing and end-use concepts for forest-based industries” of WoodWisdom-Net funded 9 consortia projects. These started with the Kick-off session of WoodWisdom-Net Program seminar in Paris in February.

The 3<sup>rd</sup> call of WoodWisdom-Net is arranged together with Era-Net Bioenergy. The Main topic is Sustainable forest management and optimized use of lignocellulosic resources. The call aims at bridging gaps between research disciplines, producers, consumers and society. The call is at present in the national funding decision stage after joint expert panel evaluation and recommendations

for national funding. The 3<sup>rd</sup> call projects will start with a Kick-off session in the 4<sup>th</sup> WoodWisdom-Net Program Seminar in 7<sup>th</sup> and 8<sup>th</sup> February in Helsinki. This seminar will be also the Mid-term seminar for the WoodWisdom-Net 2<sup>nd</sup> joint call and the Final seminar of Era-Net Bioenergy Joint Call on Short rotation coppice.

The EU FP 7. funded WoodWisdom-Net 2 project of national funding organizations and program owners is coming to its end next spring. The future perspective is to broaden, deepen and continue the chain of transnational joint calls as an Era-Net +. The EU FP 7. has an open topic “Innovation in the forest-based sector for increasing resource efficiency and tackling climate change with competitive customer solutions” jointly implemented by NMP and KBBE Programs. This opens up an opportunity to a challenging topic 4<sup>th</sup> joint call. Writing a strong proposal to the EU Commission by February 2012 and planning of a successful joint call requires good dialogue and commitment of industry, academia and funding organizations in the national and European level. The process would enable launching a joint call in the beginning of 2013 for projects to start in 2014.

Figure shows the joint calls of WoodWisdom-Net in a Time-line. If the Era-Net + will be successful the WoodWisdom-Net Program will grow to about 80 million € and over 50 transnational consortia projects.

Maybe it is too early to write about future after a potential Era-Net +. However there are interesting new

schemes of transnational collaboration under development. For example Joint Programming Initiatives and European Innovation Platforms may open up good new structures for transnational collaboration in the Forest-Based Industry. The value added of transnational cooperation is the key issue. From the continuity point of view of good cooperation it is not important what the cooperation scheme is called now or in the future.



# 3rd WoodWisdom-Net Research Programme Seminar held in Paris

The 3rd WoodWisdom-Net Research Programme Seminar was held in Paris in early February 2011. The project leaders of the 17 transnational research projects from Call 1 (2007 to 2010) presented their final results. At the same time the seminar was the official launch of nine new projects resulting from the 2nd Joint Call of the programme.

The seminar was held at the Institut Technologique FCBA in Paris, France, on February 1-2, 2011 and brought together close to 70 participants: researchers and representatives of companies involved in the projects and additional stakeholders from industry, associations and policy in the forest-based sector. The objective of the seminar was to discuss the final results and outcomes from the projects of the first call, to present the new projects of the second call, to facilitate information exchange and networking between the projects and their stakeholders and to gain feedback and information for the further development of the WoodWisdom-Net Programme.

After the welcoming words by Mr Frédéric Rouger from FCBA, the ERA-Net WoodWisdom-Net and the WoodWisdom-Net Research Programme was introduced by Dr Ilmari Absetz (Coordinator of WoodWisdom-Net ERA-NET) from the Finnish Funding Agency for Technology and Innovation (Tekes), Finland.

## Coordination of national programmes: overview FP7

What the potential future possibilities of the WoodWisdom-Net and the ERA-NETs in general, was discussed in the presentations made by Mr Oscar Barreiro from the European Commission – (DG Research, Industrial Technologies) and Mr Andreas Kleinschmit von Lengefeld from the European Forest-Based Sector Technology Platform.

The future of the ERA-NET is still somewhat unclear, as Mr Barreiro stated in his presentation. However, there are already examples from self-sustained continuation (e.g. ERA-CHEMISTRY), a topic which is part of a thematic strategy (e.g. Cooperation Themes "KBBE" or "Industrial Technologies"), and how topics develop from initial cooperation via coordination to integration (e.g. EMRP (Metrology), a multiannual joint programme on the basis of Article 169).

What has now been introduced as a new option under the Framework Programme 7 is the ERA-NET Plus



*From left to right: Dr Ilmari Absetz (Tekes) and Mr Frédéric Rouger (FCBA).*

scheme where the Member States contribute to a joint trans-national call and the EU funding for research will top up the joint call budget by 33%. Mr Kleinschmit highlighted in his presentation, in 2011 one of the most desirable possibilities for the forest-based sector is to have a dedicated ERA-NET Plus call published within one of the upcoming new Work Programmes under FP7. However, Mr Kleinschmit reminded participants that EU support covers a maximum of 20% of all research activities in the European forest-based sector.

## Short presentation of project results from the WoodWisdom-Net.

The WoodWisdom-Net projects were presented in three different sessions. Two of the sessions (Forestry – Wood Resources and Logistics chaired by Dr Konstantin von Teuffel from the Forest Research Institute Baden-Württemberg, Germany; Wood – Wood Materials and Engineering chaired by Mr Gus Verhaeghe from InnovaWood). These were held on the first day, and the third (Fibres – Wood Fibre Properties and Processing chaired by Dr Jean-Yves Escabasse from Papiertechnische

Stiftung) on the second day.

The final results of the Call 1 projects will be published in a separate final report, however presented below are some examples of how the results of the research and development have been used and/or what is the exploitation plan or plans for transferring the results into practice:

- **WOVEN – Wood formation under varying environmental conditions (presenter: Harri Mäkinen, Finnish Forest Research Institute - METLA).**

Results may be applicable in planning of forest and environmental policy actions which means help in mitigating and adapting to climate change. Thus, the project provides valuable input data for further studies such as possibilities for assessing the economic and ecological impacts of climate change and alternative management regimes.

- **IRIS – New technologies to optimize the wood information basis for forest industries - developing an integrated information system (Johannes Breidenbach, Norwegian University of Life Sciences).**

Forest planning service providers in particular, are expected to profit from the developed methods. Specific meetings and seminars were held between some of the scientific partners and industry partners where opportunities and relevance for improvement of current products (forest resource information, forest planning products) and data production facilities and tools were identified on the basis of findings made in the project.

• **WOODVALUE – Value creation in wood supply chains (Jori Uusitalo, Finnish Forest Research Institute - METLA).**

The project has shown that it is possible to estimate costs and incomes within wood value chain that provided further possibilities to compare, enhance or even optimize the key wood supply chains. The ABC costing system of sawing developed in the project will be demonstrated for the sawmills that are interested in applying the system in their production planning.



*CT scanning prior to process. Photo by the project WOODVALUE.*

• **GRADEWOOD – Grading of timber for engineering wood products (Tomi Toratti, VTT).**

Five grading machine manufacturers have access to a data base of 6000 specimens and it will be possible for them to use it for development of their business. Proposal for renewal of EN 14081-2 has been drafted and will be submitted to CEN 2011.

• **WoodExter – Service life and performance of exterior wood above ground (Jöran Jermer, SP Technical Research Institute of Sweden/ SP Träteck).**

A guidance document and related software will now be tested in practice at a national level. There are plans for capturing feedback in order to

further improve the technique, e.g. by professionals or in future research projects. Work on early indicators for decay from various test procedures will give useful input to standardization work within CEN/TC 38 WG28. A number of field tests started within the WoodExter project will continue and generate important data for future assessment and evaluation and input to CEN/TC 38 and CEN/TC 139.

• **Improved Moisture – Improved glued wood - modelling and mitigation of moisture-induced stresses (Tomi Toratti, VTT).**

The results from this project will be used as background material for development and possibly standardization (in the long-term) of wood based composites. The results will also enhance safety and reliability of timber structures and accordingly improve the reputation of wood as a structural material. Additionally, new products will increase the competitiveness of timber construction and will lead to increased market share of wood materials in the building sector.

• **FireInTimber – Fire resistance of Innovative Timber structures (Birgit Östman, SP Träteck).**

The main outcome generated by the project is the European guideline that will facilitate the extended use of wood in buildings and support sustainability goals in the construction sector by providing reliable knowledge on fire safety. The new models developed will be used as input for the next revision of the European standard for structural fire design of timber structures, EN 1995-1-2.



*The very first European wide guideline on the fire safe use of wood in buildings, published by the project FireInTimber.*

• **WinFur – Use of furfurylated wood for the production of high-performance windows made of European timbers (Susanne Bollmus, University of Göttingen).**

The project has accomplished product development and product characterization for modified wood window frame materials to be marketed in Germany and Scandinavia. The Swedish window manufacturer Tanums Fönster AB, in collaboration with Kebony ASA from Norway, have decided to produce new window prototypes from furfurylated wood and test them at SP in order to receive the P-mark so that they can start commercial production of these type of windows for the Scandinavian market.

• **TES-Energy Facade – Timber-based element systems for improving the energy efficiency of the building envelope (Frank Lattke, Technische Universität München).**

The results of the project are summarized in a TES manual to provide experts (real estate companies, planners, public clients, contractors etc.) as well as the timber construction sector with the necessary know how. The project is presented on several national and international symposiums (e.g. EBH Köln D, Energy transition at housing renovation Roosendaal NL, Finnbuild messut, Helsinki FI etc.) and has been widely published in specific media (e.g. zuschnitt AT, mikado D etc.). Through the attention raised, the enterprise partners were able to build up international contacts and new business relations (e.g. Netherlands / Alexander Gump D) and achieve contracts in publicly tendered projects (e.g. Trebyggeriet/Risør College NOR, Ambros Holzbau/RS Buchloe D).

• **FibreSurf – New Biotechnical tools for wood fibre modification and analyses (Antti Oksanen, VTT).**

While many of the outcomes of the project were fundamental in nature, the VTT (Technical Research Centre of Finland) partner was instrumental in developing the application of the polysaccharide xyloglucan as a paper wet-strength additive in laboratory and pilot scale applications. In summary, these studies further support the positive impact of XG as an environmentally friendly paper-making chemical and comprise a step toward subsequent industrial utilization.

- **ReCell – Refined cellulose derivatives for high-value biomedical products (Monica Ek, KTH Royal Institute of Technology).**

Several analytical methods were developed and tested for the evaluation of the effects of the pre-treatments on pulp. This knowledge will be valuable in future research in this field. Also the activating pre-treatments may be applicable for practical purposes in cellulose derivative industry. The results will be further discussed with the industrial partners of the consortium in order to define the practical potential of the developed pre-treatment techniques.

- **DesignCell – Designed Cellulosic Nanostructures (Mikael Ankerfors, Invenia).**

The over-all objective of DesignCell was to design new cellulosic nanostructures for new potential high-tech applications such as intelligent surfaces, templates for sensors, scaffold for bio-devices, multilayer-based high flux non-fouling membranes, optically active/conductive devices for organic electronics and membranes. Commercialisation is helped by development of both low-end applications (e.g. dry strength adjuvants, nanocoatings and surface strength applications in paper/board applications; bio-nanocomposite materials; rheology control applications (food, oil recovery, drilling muds); emulsion/dispersion applications; hygiene/absorbent products) and high-end applications.

- **HemiPop – Engineering structure and properties of poplar hemicelluloses (Luc Salmier, INRA).**

The methods and resources developed here, regarding the transformation techniques, analytical methods and antibody, are directly applicable to other research purposes, and the antibody is available to other research groups once the manuscript is published. The HemiPop project was basic research by nature and therefore immediate commercial utilization of the results is not planned. The results are, however, fundamental for the work towards understanding the role of xylan in determination of wood and fibre properties.

- **PROBARK – A sustainable process for production of green chemicals from softwood bark (Tiina Nakari-Setälä, VTT).**

The industrial have, in particular, evaluated the possibility to utilize bark components as a raw material or in their own products, e.g. tannins in adhesives (UPM-Kymmene), tannins in cosmetics (Granula), tannins in biocomposites (Tecnar) and softwood bark as a source of sulphur free terpenes and other starting materials (Arizona). Processum's interest has been to understand how bark biomass can be utilized for production of bioethanol. Södra has a general interest in biochemicals derived from bark components. The technical data and process options provided in the project will help the involved forest companies to take the lead in upscaling the tannin extraction process to industrial scale.



*Water insoluble and soluble tannin.  
Photo by the project PROBARK.*

- **FUNFIREBIC – Functional fibre reinforced biocomposites - (Markku Nikkilä, Elastopoli Oy – represented by Ilmari Absetz as the project observer).**

The main objective in FUNFIREBIC project was to produce biocomposites from functionalized wood fibres and biopolymers and to evaluate the feasibility of these biocomposites in injection molded parts for different industrial applications. The result provides a biodegradable alternative to fiber reinforced injection moulding applications.

- **BioPack – Design of biocomposites based on nanocellulose and hemicelluloses for future packaging materials (Lennart Salmén, Invenia).**

In order to explore the possible use of hemicelluloses as barrier films in packaging materials different xylans and glucomannans were characterised with regard to their film forming properties. The research performed has resulted in a substantial increase of knowledge with regard to structure–property

relations of hemicelluloses as well as to the potential benefits of reinforcements with low amounts of nanocellulose fibrils. The research has given the basis for further research in this area and allow the possibility in the future to explore the use of wood hemicelluloses in higher value added products.

- **WoodFibre3D – Structure-property relations of wood fibres: 3D characterisation and modelling (was not presented).**

Wood fibres are today applied in a wide range of products. In addition to traditional paper products, wood-fibres are also used in for example hygienic products, advanced packaging products and building products such as wallboards and MDF boards. The use of wood fibres and their components could, however, be vastly broader than it is at present. One particular promising application of wood fibres is as reinforcement in composite applications. The concept of WoodFibre3D was to apply and combine a set of advanced state-of-the-art 3D characterisation facilities to gain increased fundamental competence on the fibre structures at cell-/fibre-/wood-structure level. Due to the rather fundamental nature of the research project the results of the projects may mostly be utilized in ongoing/future research projects. The large database of X- $\mu$ CT images of wood fibre composite materials built up can be utilized as a basis for further R&D.

The Call 2 projects presented and discussed during the three sessions of the seminar are briefly summarized on the following pages of this newsletter.

At the end of the seminar the funding organisations involved in funding the 17 projects from the 1st Joint Call awarded the best projects in three different categories. The awarded projects were:

- **Best industrial involvement and relevance: TES Energy Facade**

- **Best transnational collaboration: FireInTimber**

- **Best promotion of young researchers: ReCell**

Before Dr Absetz closed the seminar with the concluding remarks, there was a round-table discussion to gauge feedback for further development of the

*Round-table panel: (from left to right) Mr André Greif (PtJ Jülich), Dr Ilmari Absetz (Tekes), Dr Eva Esping (VINNOVA), Mr Oscar Barreiro (EC), Dr Andreas Kleinschmit (FTP), Mr Petter Nilsen (RCN).*

WoodWisdom-Net Research Programme. All in all the general feedback was very positive and the participants felt that so far the WoodWisdom-Net Research Programme has been a success. It was clearly stated that the simplified way of WoodWisdom-Net to run the calls without too much administrative burden to its customers is very much appreciated. However, the future seminars could be arranged in another format to attract more audience. One possible way could be to have different seminars for different topics, or to combine a WoodWisdom-Net seminar to a larger event.

All project presentations are available for download from the WoodWisdom-Net website.



# TES EnergyFacade awarded Schweighofer Prize 2011



**SCHWEIGHOFER PRIZE  
2011**

TES EnergyFaçade, a research project funded in the first call of WoodWisdom net and coordinated by the Technical University of Munich has been awarded one of four innovation prizes of the Schweighofer Prize,

A European team of scientists developed a completely new timber based facade system for refurbishment. About 60% of all buildings in Europe have been built within 1950 und 1980, of course without taking energy efficiency into account. Nowadays those buildings urgently need renovation in terms of thermal insulation and new windows. In order to make the renovation as efficient as possible, TES Energy Façade was developed as a holistic system, which covers all working steps of the reconstruction. At the beginning the whole building will be 3D measured by a laser scanner. Then the new facades made of wooden frames (completed with insulation, windows and claddings) are prefabricated according to the 3D data. Finally the facades are installed on site.

The new tailor made „wrapping” is a vital contribution against CO2 emission. It helps saving energy and even stores CO2 in its wooden frame. TES Energy Façade is a novel approach for tackling climate change and offers new opportunities for wood in refurbishment.

The Schweighofer Prize awards innovative ideas, technologies, products and services concerning the whole value chain in order to strengthen the competitiveness of the European Forest Based Sector.

The Schweighofer Prize has been being presented every second year since 2003 and is endowed with total prize money of € 300,000 before tax. The prize is divided into one Main Prize and several Innovation Prizes.

# Kick-off seminar for the 2. Joint call projects

Second joint call for proposals within WoodWisdom-Net2 Research Programme “Sustainable, competitive processing and end-use concepts for forest-based industries” was launched in autumn 2008. This resulted in 38 proposals, involving partners from 17 different countries and additional associated countries such as Belgium and Brazil.

After the judgement of an international expert panel and the Call Committee, altogether 9 projects were funded and most projects had

their start in January 2011. The official kick-off found place at the 3rd WoodWisdom-Net Programme Seminar on 1–2 of February, 2011 at Institut

Technologique FCBA in Paris. Below is given some basic information about the projects within three research areas.

**Research area 1. Improving the performance of energy and resource efficient timber construction (massive or light-weight, new construction or renovation concepts) with new concepts, tools and processes considering total building performance.**

## €CO<sub>2</sub> project focuses on defining the carbon footprint of wooden houses during their full life cycle.

“Wood is an environmentally friendly material. Wood houses are carbon storages.” These claims have been heard countless times. But where is our scientific proof? We still lack the fundamental understanding of how carbon footprint and primary energy balances accumulate during the full life cycle of a building. Tracking greenhouse gas stocks and flows of wood-based construction materials from cradle to grave is a complicated task, especially if energy and material efficiency in different European areas are taken into account.

The €CO<sub>2</sub> project will try to cover this knowledge gap by (1) creating holistic understanding of carbon efficiency in the full life-cycle of a building, (2) by defining technical potential and

obstacles for the use of wood in carbon efficient construction, (3) by developing practical solutions for calculating and optimising the carbon footprint of different wood construction systems and (4) by disseminating results to relevant stakeholders, including e.g. authorities, regulation developers, standardisation committees and construction industry.

Currently the project makes progress with an in-depth carbon footprint assessment of reference buildings in Finland, Germany, Italy and Sweden and an analysis of environmental databases.

### PARTNERS:

Aalto University (FI), BOKU (AT), Energy Agency (AT), Finndomo (FI), GreenBuild Ltd (FI), Holzforschung

(AT), Huber & Sohn (DE), IBO (AT), Lindbäcks Bygg (SWE), Linnaeus University (SWE), Lund University (SWE), Martinsons Byggsystem (SWE), Micro Aided Design (FI), Moelven Töreboda (SWE), Politecnico di Milano (IT), SP Träteck (SWE), StoraEnso Timber (FI), TU München (DE), UPM Timber (FI), VTT Technical Research Centre (FI), WEKA Verlag (DE).

### PROJECT COORDINATOR :

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### MORE:

<http://www.eco2wood.com>

## smartTES - Innovation in timber construction for the modernisation of the building envelope

The main objective of smartTES is to advance the method of energy efficient building modernisation with large-scale prefabricated timber elements based on the results of TES EnergyFacade (ERA-Net WoodWisdom-Net 2004-2008). Based on the results of the TES EnergyFacade research project as well as the experience of the participating partners, the following further development is necessary for a marketable introduction of the building system:

- smart TES - development of a ‘value-added facade’ as a multifunctional

building envelope including a robust low tech and economic solution for an energy producing façade (air collector façade, thermal collectors, PV panels)

- Systemization of interfaces (“plug and play”) and integration of technical components, (e.g. HVAC devices, ducts, vents, ITC infrastructure, electro-installation) and development of model solutions. This includes mock-ups, testing and monitoring of properties and behaviour.

- TES extension – investigation and systemisation of legal and technical

requirements for the retrofitting of pitched and flat roofs and/or additional storeys and extensions as a densification strategy in the urban context.

- Development a coherent timber construction system for additional storeys and building extensions compatible with TES EnergyFacade
- TES in an urban context – validation and documentation of the value of TES in urban infill developments and its architectural possibilities
- Certification of ecological footprint and LCA for basic solutions

and demonstration projects

- Understanding the building and building modernisation as a holistic system of building envelope, building services, technologies, climate, energy, architecture and end user
- Climate adaption of prefabricated low energy building envelope technology
- Monitoring and testing of mock-ups and demonstration projects to gain a necessary basis of information for the development and standardisation of basic solutions
- Speed-up the process from production to assembly in order to create a holistic industrialised process that aims to minimise disturbance for

tenants and facilitates energy efficient operation and use of buildings.

- Dissemination – bringing results from research to business

#### PARTNERS:

Germany: Technische Universität München, Hochschule Rosenheim, B&O Wohnungswirtschaft, Gump & Maier GmbH, Ambros GmbH, Finland: AALTO University, Finnish Real Estate Federation, Metsäliitto Cooperative, Puuinfo Oy  
Norway: SINTEF, NTNU University Trondheim  
Austria: Drexel & Weiss

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## AcuWood – Acoustics in Wooden Buildings

AcuWood is a project established in order to improve the knowledge in Acoustics in wooden building structures (sound insulation, vibration and springiness). The project includes active participation in international research and standardization in order to achieve rapid implementation of new knowledge and as far as possible coordinate activities in Europe and globally. The aim with AcuWood is on one hand to consider a wider range of building technique and potential cultural differences between inhabitants in Europe, but also to further ensure and strengthen the European dimension and cooperation within this area. It comprises additional research activities that are necessary, to introduce the gained scientific results into international standardization and to provide the prerequisites for industrial application.

Wooden multi storey residential buildings are becoming more common. Driving forces are sustainability, industrialization and cost reductions in the construction sector. However, noise and vibration disturbances experienced by residents might become a problem, even if the building code requirements are fulfilled. Sound and vibration has thus become the new hindrance. The aim of this project is to develop sound and vibration criteria that fit better with human experience in wooden lightweight buildings. The project includes collection of data, analysis based on statistical



*Acoustically optimized wooden buildings is a challenge in the future (photo: AcuWood project)*

methods and development of criteria.

The overall objectives of the project are:

- to find objective descriptions of sound insulation, impact noise, vibrations and springiness that give an evaluation of the acoustic quality that is independent of the type of building system
- to maintain and further develop the competence within building acoustics (in particular regarding lightweight structures) at the participating research organisations in the long term perspective
- to create preconditions for the development of acoustically optimized building constructions with respect to the actual noise exposure in residential buildings and the subjective perception of the occupants

- to increase cooperation between actors in the innovation system; universities, institutes, consultants and industry
- to increase the knowledge base in the industry and among consultants for future development and increased competitiveness of lightweight structures

#### PROJECT COORDINATOR:

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#### PROJECT PARTNERS:

Fraunhofer Institute (DE), Lignum (CH), Masonite Beams AB (SE).

## Research area 2. Creating new business opportunities through innovative wood and fibre-based products and composites with properties optimised to the end use requirements and sustainable use of resources.

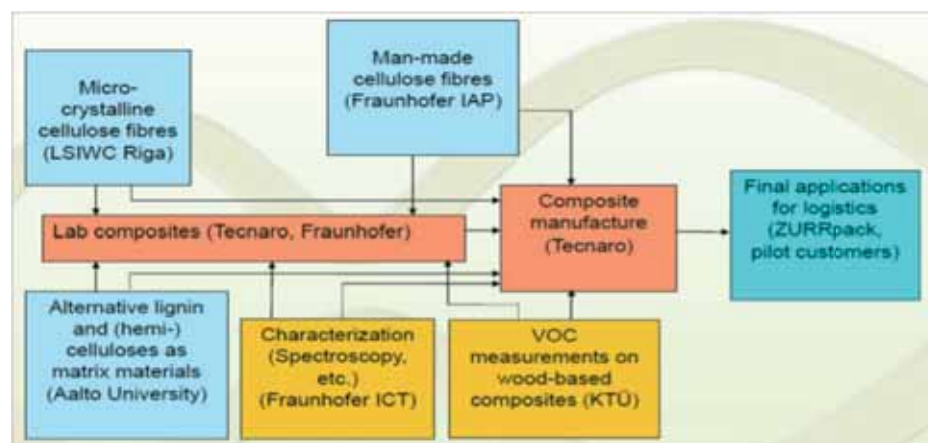
### LiLo – Development of advanced lignin-cellulose-composites with high impact properties for Logistic

The aim of the LiLo project is to investigate and develop lignin-cellulose-based composites for the application in logistic systems, like e.g. containers, pallets and parts for other transport systems.

After the definition of requirements and specifications advanced wood based raw materials like lignin from different sources and processes, microcrystalline cellulose and manmade cellulose fibres are generated and investigated in order to develop lignin-cellulose composites with high impact strength. These materials will be customized for logistics applications.

#### Expected Project Impact

The use of renewable raw materials for the proposed composites contributes to the reduction of CO<sub>2</sub> emissions and reduces negative climate changes. Hemicelluloses and lignin applied as material components reduce waste and do not lose their intrinsic energy. However, during lifetime of the products CO<sub>2</sub> remains bound in the material. Production of the new materials and products creates new jobs and/or contributes to secure existing jobs in the wood based value chain. For the



Overview of workpages and responsibilities within the LiLo project

companies from the forestry and pulp sector new applications for lignins, hemicelluloses as well as cellulose with added value will be created. This improves their competitiveness. Tecnar will produce novel bio-based materials for logistics application. ZURRpack and other pilot customers will apply the wood based materials in their products.

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#### PROJECT PARTNERS:

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#### MORE:

[http://www.woodwisdom.net/mm\\_files/do\\_889/20110202\\_LiLo.pdf](http://www.woodwisdom.net/mm_files/do_889/20110202_LiLo.pdf)

### Mould Pulp – Development of Durable, Fully Bio-Based Thermoplastic Composites from Bioplastics and Pulp Fibres for Injection Moulding Applications

The Swedish company Innventia together with an industrial consortium has developed a promising wood-polymer material from cellulose pulp and PLA. Launched by Södra under the name DuraPulp® the material shows good mechanical properties, a perceived naturalness, nice tactile properties and can be dyed with clear colours. By now, DuraPulp® is only available in form of composite pulp bales to be further processed by a specifically compression moulding into final products. The research project »MouldPulp« aims to develop a processing technology that allows making injection moulded parts out of DuraPulp® but keeping the naturalness material identity.

A multidisciplinary and international team from Sweden, Finland and Germany led by Fraunhofer UMSICHT is working on this.

An initial market research has brought to light that soft characteristics like clear colours in combination with natural appearance and natural touch are valued. At the same, limiting factors for the use of MouldPulp are mechanical properties like heat distortion resistance and material strength.

Furthermore, the market research has shown multiple niches for MouldPulp. Experts predict market potential across several branches, especially in consumer articles, electronics / IT and

automotive. Most promising applications are seen in design and decoration, toys, and household items.

**PROJECT COORDINATOR:**  
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Fraunhofer UMSICHT (DE), Södra (SE), Hammarplast Consumer AB (SE), Innventia AB (SE), FKUR Kunststoff GmbH (DE), nova-Institut

### Research area 3. Increasing the competitiveness of the forest-based value chain by strategic technology renewal, new business strategies and production systems.

#### WoodSens - Developing and implementing formaldehyde online-sensor systems in wood-based panel processing

WoodSens will enable wood-based panel (WBP) manufacturers to ensure that their products conform to the latest and forthcoming regulations on formaldehyde emission by monitoring and control formaldehyde emissions from the WBP in real time.

The project is divided into four steps. The first step focuses on fundamental research on the relationships between raw material characteristics, process parameters and gaseous formaldehyde emissions during and after hot-pressing. The next step is developing a laboratory sensor system to directly detect the gaseous formaldehyde emissions from WBP-samples. In parallel a statistical process model will be developed to predict the final formaldehyde emissions from the WBP in real time. The last step is developing and verifying an online-sensor

system in an industrial plant trial.

The Georg-August University of Göttingen is project coordinator, the Glunz AG as one of the leading WBP producers in Europe, GreCon as a worldwide known and proven manufacturer of quality assurance measuring equipment for the WBP industry and the Laser-Laborium of Göttingen as an institute with major focus on applied basic research in the field of laser technology are German participants. France is represented by FCBA, which is an industry-focused research and testing laboratory dealing with the entire range of wood utilization and the Ecole supérieure du Bois, a higher education research and development institution, with extensive competence in WBP and a special emphasis on recycled wood issues. AIDIMA, a leading technology institute in Spain, is



concerned with furniture, wood, packaging and related industry technologies.

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**MORE:**  
<http://www.woodsens.com>

#### Hi-Fretech – High-frequency impregnation of wood

The key objective of this project is to develop a new impregnation process based on high-frequency electromagnetic waves to extend the service life of wood products from species that are very difficult to impregnate. The increased impregnability with fire retardants, wood preservatives and wood modification agents will improve the properties and service life performance of cladding, panelling, decking, fire safety doors, outdoor furniture, garden infrastructure (sheds, fences, compost bins, post, etc), and other structural elements. The project outcome will increase the general public's confidence and positive perception of wood and wood products and thereby, strengthen their perception of wood as suitable material for use in these applications.

The first high frequency impregnation processes with Spruce have been performed and the effects of different temperatures and vacuum intensity have



*Hi-frequency Impregnation plant*

been investigated. The next step as part of the project will be the optimization of the process before mechanical properties as well as durability tests start.

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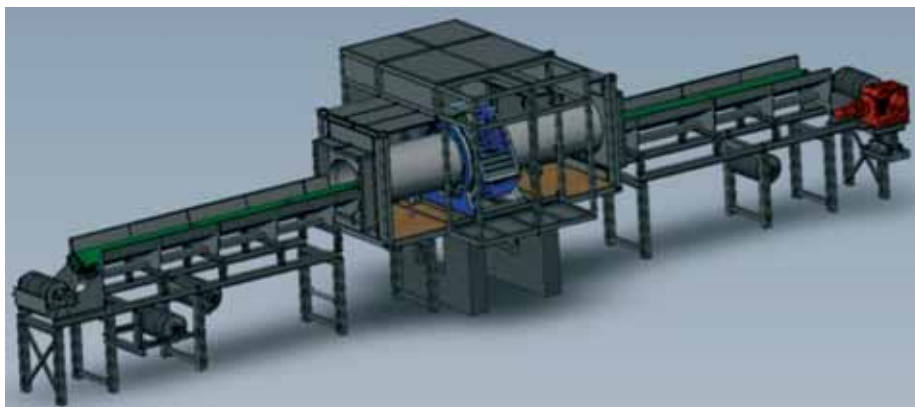
**MORE:**  
<http://hifretech.eu/>

## CT-Pro – New Forest Industry Production Systems Based on High-speed CT Scanning

The project has an overall objective of developing new production strategies for the forest-based industry based on industrial high-speed computed tomography (CT) scanning.

The hypothesis is that efficiency, customer adaptation and value creation strategy that is based on detailed knowledge about the individual saw log. The goal is to develop strategies and tools that give 10% higher value in the wood production chain. This includes an industrial high-speed CT scanner prototype and algorithms for automatic analysis of data from such a scanner. By reaching these goals, the project contributes to a transformation of the forest-based industry from resource intensive to value-added knowledge intensive.

The scientific objective is to extract important and detailed information from a log scanned with a specifically developed industrial high speed CT scanner, and also to utilize this information in a production strategy. The technological objective is to CT scan saw logs at high speed, i.e. up to 2 m/s, and thereby generate detailed information of the inner properties of an individual saw log.



*Model of the high-speed CT scanner being developed in the project.  
(Illustration: MiCROTEC)*

A survey of possible strategies has been performed and the most important properties in the CT images have been identified. Currently, the main focus of the project is the development of the image analysis algorithms required to extract these properties, as well as the construction of a prototype scanner.

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**MORE:**  
<http://www.sp.se/en/index/research/CT-Pro/>

## DEMOWOOD Optimisation of material recycling and energy recovery from waste and demolition wood in different value chains.

This project aims at investigating valorisation concepts for maximising the added value of waste wood in value chains such as pulp production for paper products, particle board production and large scale energy recovery systems: combustion plants and liquid biofuels production.

The benefit is to reduce forest resource pressure, reducing the environmental impact of waste wood management, while contributing to the objectives of increasing the use of a renewable resource and reducing the greenhouse gases emissions in the material and energy sectors.

DEMOWOOD is structured in 6 technical work packages which explore the current situation with waste wood management in the partners countries (France, Finland, Germany), the possible

improvements of waste wood characterization and sorting technologies, the potential for using increased quantities of waste wood into pulp production, particle board production and biofuels; an environmental and economical assessment of the recovery and recycling pathways is also planned. The project has started in the beginning of 2011 and at this stage, an analysis methodology and a first overview of wood waste management situations in the partners countries is being prepared. Concerning the detection and sorting technologies for waste wood, a review of stakes and a state of the art are also under preparation. Technical work packages for the research on recycling progresses are scheduled to start in October 2011.

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**WEB :**  
[www.wwnet-demowood.eu](http://www.wwnet-demowood.eu)

# Successful Joint Call together with ERA-Net Bioenergy

WoodWisdom-Net 2 and ERA-NET Bioenergy have joined forces to promote transnational research and development along the whole innovation chain and across sectors.

The ERA-Nets WoodWisdom-Net 2 and ERA-NET Bioenergy increases the cooperation and coordination of research activities carried out at national level by joining forces to promote transnational research and cooperation. After two successful Joint Calls within the WoodWisdom-Net Research Programme the partners of WoodWisdom-Net 2 have cooperated for the first time with another ERA-Net for implementation of a Joint Call. The 3rd. Joint Call "Sustainable forest management and optimised use of lignocellulosic resources – Bridging gaps between research disciplines, producers, consumers and society" was launched together with ERA-NET Bioenergy in September 2010.

It was back in 2009 when early ideas for a joint call for proposals were discussed for the first time between representatives of WoodWisdom-Net and ERA-NET Bioenergy. Since forest biomass is an important source for bioenergy production, the sustainable management of forests for increasing feedstock production for bioenergy, it is considered a relevant research area for ERA-NET Bioenergy partners. At the same time multiple forest functions have to be balanced in a sustainable way including wood production for material use. Here are the links to wood material science and engineering in forest-based value chains which are in the focus of WoodWisdom-Net 2. This was the starting point for the actual cooperation of the two ERA-Nets on that topic. By joining forces the two ERA-Nets aimed to:

- create greater impetus, approach more researchers and allow for interdisciplinary R&D projects
- bring together partners along the whole innovation chain from basic and applied research to industrial development
- promote interdisciplinary collaboration and involvement of stakeholders
- promote the participation of researchers outside EU
- promote mobility and training of young researchers
- bridge gaps between

research disciplines, producers, consumers and society

During 2010, partners from both ERA-Nets prepared the joint call and defined the call topics together with research experts and key stakeholders. The scope of the joint call is broad, covering forest management, land use and innovative production in value chains including bioenergy, biorefinery and wood and fibre based products. It covers the following topics:

1. Forest for multiple needs of society, including enhanced productivity and optimised use of forest feedstock
2. Advanced products and technologies for primary wood processing and manufacturing of wood and fibre-based products
3. Advanced biofuels and biorefineries

Altogether 19 national funding organisations from 13 countries have committed total public funding of ca. 17 M€ for this call to be jointly provided during 2011-2014.

The implementation of the joint call followed a two step procedure for project evaluation and selection. For the first step of the joint call which closed on 1st of December 2010, an impressive number of 81 proposals from consortia with over 660 participating organisations in total were submitted. These pre-proposals were jointly evaluated by the participating funding organizations and 40 projects invited for the second step. The full proposals submitted by 31st of March 2011 were then jointly evaluated by an international expert panel in a peer review process. Because of the high number of high quality proposals and the limited funding available this was a challenging task for the experts. Based on the experts' evaluation and ranking the Call Committee representing all participating funding organisations finally recommended 13 projects for funding (one of them being merged from two separate original proposals). Despite the large group of funding organisations with a

Pulling bioenergy research together



The ERA-NET Bioenergy networks national bioenergy research programmes to improve cost-effectiveness and ensure the maximum research impacts for this vital energy sector. ERA-NET Bioenergy has been running for six years (2004-2010) funded by the European Commission under FP6. Authorities from ten countries have been participating in ERA-NET Bioenergy. From 2011 eight countries decided to continue the network and the important work on bioenergy research without EC funding. Partners from five countries decided to participate in the Joint Call "Sustainable forest management and optimised use of lignocellulosic resources" together with partners from WoodWisdom-Net 2. ERA-NET Bioenergy already implemented four joint calls before this one: on small-scale combustion, on cleaning of product gas from biomass gasification, on short rotation coppice and on clean biomass combustion [www.eranetbioenergy.net](http://www.eranetbioenergy.net)

background of two different ERA-Nets the whole process functioned in an efficient way and according to schedule.

The projects recommended for funding cover all three topic areas of the call, some of them including aspects from different topic areas. All selected projects are highly innovative, include good industry participation, exhibit strong inter- and trans-disciplinary cooperation and promote young researchers. Some projects include partners from South America, the US and other European countries although they were no official partners to the joint call, thus strengthening the international network links of the European research community.

At the moment the official funding

...continue next page

## Norwegian Institute of Wood Technology

The next stop was a visit to the Norwegian Institute of Wood Technology at Blindern, where Dr Jørn Brunsell, Managing Director, welcomed the group with a lunch meeting and presentation on the Institute. Today there are 38 persons employed at the institute and it is run as a private R&D Institute. Traditionally, the research has mostly dealt with sawmilling and wood preservation themes, but the focus has changed gradually towards the end user's concerns of the value chain as furniture, housing, windows. Annual turnover is about 5 M€, where R&D is about 45%, documentation and certification is 28% and rest is about requests from companies for special tasks, international cooperation etc.

Leading edge of competence in the institute today is in areas such as gluing, drying, grading and preservation. Target areas are bridges, solid wood units (for instance cross laminated timber), urban timber construction, wooden facades. The institute is involved in several WW-Net projects from the calls.

Dr Ulrich Hundhausen told us about an ongoing project "ekstra Tre" concerning discolouration in softwood in connection with surface modification.

The group visited the laboratory facilities and followed the actual strength testing process of fingerjoint timbers, which were forced to break with a loud noise.

### New Opera house

The full day visiting programme ended at the new Opera house in marble and glass in Bjørvika, Oslo harbour. This remarkable building, mainly built on former reclaimed land areas, took more than five years to build and is the largest culture building ever constructed in Norway since the medieval Nidaros dome in Trondheim from the 14th century. The main auditorium with accommodation for more than 2000 visitors is one of the most technical advanced in the world today. The backstage area is almost as large as the main hall area and covers several thousand square meters. There was an extended use of wood (oak) for the indoor facilities and decorations which contrasted with the marble and glass in a pleasant manner.

A very special "thank you" to Petter Nilsen and the Research Council of Norway for arranging this most interesting visiting programme.

EVA ESPING



*The old family house which now is part of the passive house at Røa*

*...continue from last page*

partners to the joint call, thus strengthening the international network links of the European research community.

At the moment the official funding decisions are taken by the national funding organisations following their national procedures. This process is expected to be finished in late autumn. Then more details of the funded projects will be published by WoodWisdom-Net. The projects are expected to start in late 2011 or January 2012. A joint programme seminar for all projects from this joint call and the previous WoodWisdom-Net Call (2009) will be held on 7-8 February 2012 in Helsinki to support networking between the running and newly starting projects. All stakeholders and interested researchers are invited to learn more about these exciting projects in Helsinki. We are looking forward to meeting you there.

### MORE INFORMATION:

Joint Call: [www.call2010.woodwisdom.net](http://www.call2010.woodwisdom.net)

ERA-NET Bioenergy:

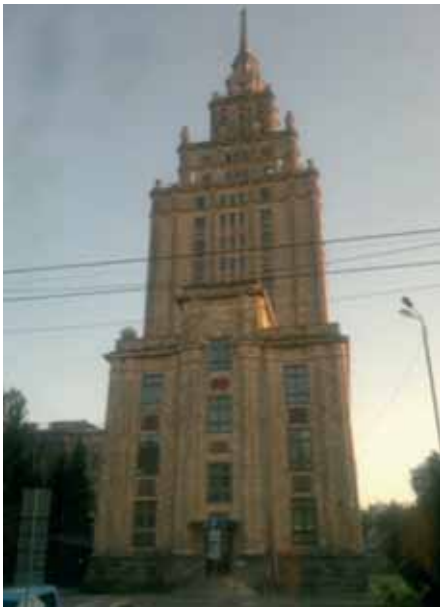
[www.eranetbioenergy.net](http://www.eranetbioenergy.net)



*Meeting of the Joint Call Committee of the ERA-Nets WoodWisdom-Net 2 and Bioenergy in January 2011 in Berlin*

# Visiting Programme to Riga and Jelgava in Latvia

To facilitate cooperation between the organisations participating in WoodWisdom-Net 2, visiting programmes are arranged in participating countries as part of Work Package 2. In May 2011, the sixth visiting programme in the WoodWisdom-Net consortium was arranged in conjunction with a Steering Committee meeting in Riga, Latvia.



*The Latvian Academy of Sciences in Riga is located in this spectacular building, designed by Lev Rudnev.*

17 people from 14 partners in 10 WoodWisdom-Net countries participated in the visiting programme. The first part of the programme, an update meeting, was held in the Latvian Academy of Science in the city of Riga. Mr Janis Birgelis from Ministry of Agriculture, Food and Forestry Policies in Latvia, welcomed the participants to Latvia and gave a short introduction on the Latvian Academy of Science (LAS), which was founded as the Latvian SSR Academy of Sciences. Since February 1992, LAS is working as an association of individual scientists and represents Latvia in international associations for scientists and academies. The Ministry of Education and Science has delegated to the Latvian Academy of Sciences the implementation of ERA-Net projects in Latvia.

After the meeting a bus transfer took the participants on a one-hour journey to the Forest and Wood Products Research

and Development Institute (MeKA) at Jelgava. Here Mr Edgars Bukšāns, Technical Manager at MeKA, gave an overview of the activities of the institute and its background. MeKA was founded in 2004 in order to integrate education, science and industry along with some wood testing activities. In 2007 the institute became a member of EGOLF (provides a focus for fire testing issues in Europe) and in 2008 testing for construction products was added to the activities of the institute.

Today, the institute employs 23 people, the annual turnover is about 5 M€, and about 2/3 of the activities are focussed on research and 1/3 on testing. The research is carried out in the following areas:

- Wood Material and product properties
- Wood Material properties improvement by modification (thermal treatment, densification)
- Glued joints and laminations for structures and components
- Wet wood gluing technology application
- Influence of temperature on glued joints and strength properties
- Light weight cellular wood material application for structural purposes, new product development
- Fire safety
- Quality parameters
- Monitoring of the economic situation within the sector.

Today, training activities at MeKA are focused among other things on training of drivers for harvesters. The institute is also participating in COST Actions (European Cooperation in Science and Technology).

Next Ms Agnese Plocina gave a brief introduction to the Latvian Forest Industry Federation. Ms Plocina is working as Marketing Director at the

Federation. The Federation has around 140 member companies from seven different smaller organisations, representing different parts of the forest value chain. The Federation itself is a member of different organisation at a European level, such as CEI-Bois, EOS and European Furniture.

Latvia, like other Northern European countries in general, has a rather large area covered by forests (about 50%) which amounts to around three million hectares of forest lands. On a commercial basis, spruce and pine are the most common species (54%) followed by birch (30%). Around 20% of all sawn wood goes for export which means a very high level of domestic use. The aim is to improve the added value component in the sawn products for the export markets.

After the presentations, Mr Bukšāns guided the visitors around the laboratory facilities, most of which are connected to testing and standardisation activities. Mr Bukšāns also introduced a new “wood material” suitable for use in different building components. This material is currently being tested for acoustics and fire retardant qualities.

The opportunity to visit the institute and its laboratories and to listen to the presentations of Mr Bukšāns and Ms Plocina was greatly appreciated. Sincere thanks to Ms Dace Tīrzīte at LAS, who organised this most interesting programme.

*EVA ESPING*



*Mr Edgars Bukšāns, Technical Manager at MeKA*

# Visiting Programme in Oslo

To facilitate cooperation between the organisations participating in WoodWisdom-Net 2, visiting programmes are arranged as part of Work Package 2. In June 2011, the seventh visiting programme in the WoodWisdom-Net consortium was arranged in conjunction with a Steering Committee meeting in Oslo, Norway.



*Ilmari Absetz and Lothar Mennicken viewing Oslo from the Holmenkollen skijump tower.*

A group of nine people from 6 WW-Net countries and eight partners participated in the visiting programme. As an introduction for the visiting programme, Mr Petter Nilsen, special advisor at the Research Council of Norway, welcomed all WW-Net partner's representatives to the Steering Committee Meeting.

The Research Council's roles are to:

- Advise the Norwegian government
- Fund and support basic research as well as implement national thematic priorities and also support private R&D
- Networking and dissemination
- Internationalisation

Research in the Forest value chain is funded mainly within:

- The Research Programme on Nature-based Industry ( Forestry, policy, market, management, harvesting, wood use, tree building, climate change, including WW-Net2)

But also within other programmes:

- User-driven Research based Innovation (Biorefineries, paper and pulp, fiber)
- Clean Energy for the Future (Bioenergy)
- Programme for environmental research (basic research on ecology and environment)

Usually 30-50% additional financial support from industrial partners are requested in all programmes. The number of on-going projects are about 130 and involve 3 research institutes, 4 universities, 5-6 large companies and a large numbers of SMEs.

## Visiting tour in Oslo

The first stop on our visiting tour was at Holmenkollen, a very famous ski resort area near the centre of Oslo, but at a higher altitude which secure good access to snow for a long skiing season. Several world championships have taken place here but this was a bit difficult to imagine on this early summer day. The stop included a visit to the Ski Museum, which was a tribute

to the very famous explorer Fridtjof Nansen and other famous Norwegians, especially later-day skiers. The Museum has an impressive collection of old and more modern models of skis, used by Norwegian skiers on display.

The group also made a trip up the recently opened ski jumping tower almost 400 meter above sea level, with a marvellous view of 360o over the entire Oslo area.

## New wood apartment

Next stop took the group to a rather new -four-storey apartment building constructed in wood at Røa in Oslo, where we met Ms Frederica Miller, the architect at GAJA-Oslo AS, Norway. Originally the structure was a two-storey wooden private dwelling house on the site, but there was a very strong interest from the owner to expand it to an apartment building for accommodation for several families. Frederica Miller told us about the long process from an idea about building an "eco-friendly multi-storey house", based on a passive house concept, through all discussions and negotiations with the authorities in Oslo.

The main focus of the new building is on sound indoor climate achieved only through natural ventilation. Additional information is to be found at: <http://www.arkitektur.no/?nid=205912>.





# Partner organisations of WoodWisdom-Net

## Finland

- Finnish Funding Agency for Technology and Innovation (Tekes). [www.tekes.fi](http://www.tekes.fi)
- Ministry of Agriculture and Forestry (MMM). [www.mmm.fi](http://www.mmm.fi)
- Academy of Finland (AKA). [www.aka.fi](http://www.aka.fi)

## Denmark

- Danish Forest and Nature Agency (DFNA). [www.sns.dk](http://www.sns.dk)
- Danish Agency for Science, Technology and Innovation (DASTI). [www.fist.dk](http://www.fist.dk)

## Germany

- Federal Ministry of Education and Research (BMBF). [www.bmbf.de](http://www.bmbf.de)
- Project Management Agency Jülich (PTJ). [www.fz-juelich.de](http://www.fz-juelich.de)

## Norway

- The Research Council of Norway (RCN). [www.rcn.no](http://www.rcn.no)
- Innovation Norway (INVANOR). [www.invanor.no](http://www.invanor.no)

## Sweden

- The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (FORMAS). [www.formas.se](http://www.formas.se)
- Swedish Governmental Agency for Innovation Systems (VINNOVA). [www.vinnova.se](http://www.vinnova.se)

## Austria

- Austrian Research Promotion Agency (FFG). [www.ffg.at](http://www.ffg.at)

## France

- Ministry of Agriculture, General Direction for Forest and Rural Affairs (MAAPR). [www.agriculture.gouv.fr](http://www.agriculture.gouv.fr)
- Technical Centre for Wood and Furniture (CTBA). [www.ctba.fr](http://www.ctba.fr)
- National Institute of Agronomical Research, (INRA). [www.inra.fr](http://www.inra.fr)

## United Kingdom

- Forestry Commission (FC). [www.forestry.gov.uk](http://www.forestry.gov.uk)
- Scottish Enterprise Dumfries and Galloway (SEDG). [www.scottish-enterprise.com](http://www.scottish-enterprise.com)

## Nordic Forest Research Co-operation Committee (SNS)

[www.nordicforestresearch.org](http://www.nordicforestresearch.org)

### Main activities

- Benchmarking and dissemination of good practices
- Identification of complementary research activities
- Identification of practical networking and opening mechanisms for future cooperation
- Implementation of joint evaluation and foresight activities
- Identification together with stakeholders (e.g. industry) of the research areas and instruments needed to improve competitiveness and sustainability of the forest cluster
- Implementation of a trans-national research programme to improve competitiveness and sustainability of the forest cluster

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