Overview: COST Actions in the scope of InnovaWood

This document contains a summary of all COST actions in the FPS Domain that are still running or that have been running during the past 7 years and that are dealing with wood materials, wood technology and wood industries. Extended information on activities these COST actions can always be found on the portals of each COST action or/and on the COST homepage.

Content:

Cost action FP 1407

Understanding wood modification through an integrated scientific and environmental impact approach (ModWoodLife)

Chair: Andreja Kutnar
Vice Chair: TBA
Website: none
Start of Action: unknown
End of Action: unknown

The forest-based sector can become a leader in achieving the European Commission's ambitious target of reducing CO2 emissions with innovative production technologies, reduced energy consumption, increased wood products recycling, and reuse. Apart from these undoubted environmental benefits, the use of forest products in long life products, such as built environment applications, allows for the possibility of extended storage of atmospheric carbon dioxide. Wood modification (chemical, thermal, impregnation) is an assortment of the innovative processes currently being adopted. Though many aspects of these treatments are known, the fundamental influence of the process on product performance, the environment, and end of life scenarios remain unknown. It is essential to integrate interactive assessment of process parameters, developed product properties, and environmental impacts. To optimize modification processing to minimize environmental impacts, much more information must be gathered about all process related factors affecting the environment (VOC, energy use, end of life use, etc.). This Action will investigate modification processing and products design with emphasis on their environmental impacts. This will require analysis of the whole value chain, from forest through processing, installation, in-service, end of life, second/third life (cascading) and ultimately incineration with energy recovery.

Cost action FP 1404

Fire safe use of bio-based building products

Chair: Mr Joachim SCHMID
Vice Chair: Prof Massimo FRAGIACOMO
Website: http://www.costfp1404.com/en/Sidor/default.aspx
Start of Action: 05/12/2014
End of Action: 04/12/2018

Bio-based building products have a very long history, e.g. as timber structural members. Combustibility was the main reason why bio-based building materials were banned from many applications. When performance based design (PBD) became possible many building regulations opened the market for bio-based building products. However, large differences between regulations in countries exist and the use of combustible building products is still very limited. Modern living offers attractive, flexible buildings and aims for cost efficient building techniques. Sustainability of building products became an issue. Consumers demand renewable products; however the Fire Safety of the end-product has to remain on a high level.

Fire Safety Engineering (FSE) has achieved large acceptance in the recent years. FSE allows a PBD with customized building solutions. However, the available techniques are often limited to non-combustible materials.

During the last decade the portfolio of building products made from bio-based raw materials has increased enormously. The material properties affecting a possible fire development vary which has been confirmed in many development projects including European researchers.

This Action wants to create a platform for networking, exchange and collection of performance data, experiences, authority- and climate requirements which affect the design with respect to the Fire Safe Use of Bio-based Building Products. By systematically organisation knowledge in this area will advance at a significant higher rate. TheAction will Exchange researchers, organize Workshop and create comprehensive dissemination material.

Cost action FP 1402

Basis of structural timber design - from research to standards

Chair: Dr Philipp DIETSCH
Vice Chair: Prof Jochen KOHLER
Website: none
Start of Action: 25/11/2014
End of Action: 25/11/2018

In the last two decades, the basis of scientific knowledge in timber engineering has developed immensely. The documented results, however, are inhomogeneous and fragmented and do not provide timber engineering community with the relevant information to prove the reliable and safe application of newly developed wood products in construction. The aim of the Action is to overcome the gap between broadly available scientific results and the specific information needed by designers, industry, authorities and code committees, providing transfer for practical application in timber design and innovation. This will be achieved by the coordination, consolidation, harmonization and dissemination of recent efforts in research and development that aim at enhancing existing or deriving new methods and design rules for timber structures. The results of this Action will increase the confidence of code-writers, authorities, designers and end-users in the safe, durable and efficient use of timber in structures and consequently increase its acceptance and use in the design of buildings.

Cost Action FP1306

Valorisation of lignocellulosic biomass side streams for sustainable production of chemicals, materials & fuels using low environmental impact technologies

Chair: Dr Rafael LUQUE, Universidad de Cordoba, Spain
Vice Chair: Prof Konstantinos TRIANTAFYLLIDIS, Aristotle University of Thessaloniki, Greece
Website: none
Start of Action: 15/05/2014
End of Action: 14/05/2018

Scientists are prompted to seek alternative methodologies for the production of materials, fuels and chemicals using low environmental impact technologies and greener methodologies with comparable efficiencies to those currently available in view of the expected resource scarcity and future oil economy. Lignocellulosic residues can constitute a highly promising (and currently largely under-utilised) feedstock with a significant potential to be converted into useful end products. However, a joint multidisciplinary effort from several disciplines including (bio)chemistry, biology,

(bio)chemical and biological engineering, forest products sciences as well as environmental sciences and experts in economic assessment in liaison with industry is required to appropriately address the efficient transformation of such residues. The main objective of this COST Action will be to develop a solid European multidisciplinary network able to provide a range of innovative alternatives to the valorisation of lignocellulosic residues to chemicals, fuels and materials making use of environmentally sound protocols from pretreatment/fractionation to conversion to valuable end products.Thus, this Action will bridge gaps between academic disciplines as well as between academia and industry by bringing together skills and expertise that cross scientific borders interconnecting different technology hubs across Europe, overcoming technological barriers, going beyond current lignocellulosic waste exploitation/management approaches.

Cost Action FP1303

Performance of bio-based building materials

Chair: Dr. Dennis JONES, SP Wood Technology, Sweden
Vice Chair: Dr.Christian BRISCHKE, Faculty of Architecture and Landscape, Germany
Website: www.costfp1303.com
Start of Action: 22/10/2013
End of Action: 21/10/2017

Maintaining and expanding the market potential for bio-based building products in indoor and outdoor construction uses remains a key activity for European industry in the forestry and biotechnological sector. Performance data for many environmental friendly building materials are lacking as well as suitable comprehensive test methodologies to determine their resistance against mould, stain, and decay. The similarity in terms of decay hazard, resulting response on climatic loads and thus performance of different bio-based building materials has not yet been recognised adequately, wherefore this Action will provide a platform for networking and scientific exchange between different disciplines, such as material sciences, wood technology, biology, biotechnology, building physics and engineering. Consumer demands and preferences, which might serve as limit states to develop service life prediction and performance models, will consider aesthetical aspects as well as the functionality of building assemblies. A coordinated effort to put the issue of biodegradability of organic building products on the agenda will contribute to the control and prevention of this imminent threat to use bio-based building materials, which in turn could severely damage a pan-European low carbon building agenda.

Cost Action FP1302

Wood Musick

Chair: Dr. Sandie LE CONTE, Cite de la musiqueMuse de la musique, France.
Vice Chair: Dr. Pascale VANDERVELLEN, Royal Museums of Art and History, Belgium.
Website: none
Start of Action:06/11/2013
End of Action: 05/11/2017

This Action aims to combine forces and to foster research on wooden musical instruments in order to preserve and develop the dissemination of knowledge on musical instruments in Europe through inter disciplinary research. The proposed program involves curators and conservators on the one side, wood scientists, chemists and acousticians on the other side, and finally, researchers in organology and making of instruments.As part of the CIMCIM (International Committee of Musical Instrument Museums and Collections) network, working with some members of the former WoodCultHer COST and with makers, the project will integrate study, conservation and

preservation works on musical instruments in heritage, and will allow the different European teams working on wood to participate in research projects on musical instruments. The collaboration will help to develop cooperative programs on specific projects about the study and identification of artefacts and about the conservation of musical instruments.

COST Action FP1205

Innovative applications of regenerated wood cellulose fibres

Chair: Dr. saOstlund, Wood Technology, Sweden.
Vice Chair: Dr. WimThielemans, KULeuven, Belgium.
Website: www.costfp1205.com
Start of Action: 23/05/2013
End of Action: 22/05/2017

Demand for high performance products is increasing globally, as is the demand for more environmentally responsible sourcing. The combination of these facts places significant strain on traditional material supplies and processing. Fibre demand and nanocellulose are two such area of increasing demand, where diversification of fibre supplies is necessary to provide the demands and allow use of land for agricultural food purposes and biorefinery / biofuel supply. One area where fibre supply is increasing in supply is through the wood industry. This is through greater forest reserves under sustainable forestry practices, especially across Europe. However, it is necessary to think outside the box on how this resource can be put to optimum value (i.e. in areas in addition to construction, pulp & paper and bioenergy). This Action aims to develop the sustainable emerging technologies in the areas of textile fibre production, cellulosic fibres, and the various forms of nanocellulose derived solely from wood. This advancement needs to be undertaken within a COST framework not only to provide a means of information sharing, but to educate and train scientists in new areas of development. Through a programme of collaboration and knowledge exchange and training, this Action will develop a pan-European leap in capabilities, product and processes. This will lead to an improvement in the environmental credentials of advanced cellulose-based materials, strengthening R&D and innovative material production across Europe

COST Action FP1105

Understanding wood cell wall structure, biopolymer interaction and composition: implications for current products and new material innovation

Chair: Prof. Philip Turner, Center for timberengineering, United Kingdom
Vice Chair: Prof.ArnisTreimanis, LS Institute of Wood Chemistry, Latvia
Website: http://www.napier.ac.uk/forestproducts/cost-action/Pages/Home.aspx
Start of Action:24/05/2012
End of Action: 23/05/2016

The primary objective of the proposed Action is to build knowledge and understanding of fundamental physical (self-assembly) processes and biological systems (e.g. genetic control) that drive natural structures and biopolymer composition within the plant/wood cell wall and to use new knowledge of self-assembly processes to support the development of new biopolymer based materials. The Action also aims to quantify the impact of new knowledge on our understanding of the mechanical properties of the cell wall and how processes such as pulping, bleaching recycling, cell wall disintegration methods and ongoing tree improvement and biotechnology programmes impact both positively and negatively on structure and composition of the cell wall. The intent is to explore how this knowledge can be used to support ongoing improvement in these areas of activity.

An overarching goal is to develop multidisciplinary competence and capability to support these objectives and to work closely with commercial organisations to promote effective dissemination of knowledge and the development of a more economically sustainable Forest Based Sector.

COST Action FP1101

Assessment, Reinforcement and Monitoring of Timber Structures

Chair: Dr Dina Dayala, University of Bath, United Kingdom
Vice Chair: Dr Jorge GONçALVES BRANCO, Universidade do Minho, Portugal.
Website: http://cost-fp1101.ibmb.tu-bs.de/index.php/fp1101start.html
Start of Action: 22/11/2011
End of Action: 21/11/2015

In recent years, the use of timber in structures has become particularly important, considering that it is the only truly renewable building material and carbon storage. Timber has been used as structural material for centuries and numerous examples demonstrate its durability if properly designed and built and when adequate assessment and monitoring has been applied. The objective of the Action is to increase the acceptance of timber in the design of new structures and in the repair of old buildings by developing and disseminating methods to assess, reinforce and monitor them. The need for assessment, reinforcement and monitoring of timber structures can arise from multiple motivations such as the expiration of the planned lifetime, materials aging, exceptional incidents, and ever more important, a change of use. The Action will benefit from multidisciplinary views of the problems and followed innovative solutions by the involved stakeholders, enable synergies between them and provide an effective way of discussing and disseminating the results from ongoing projects within this research area to the European industry. The Action will increase the confidence of designers, authorities and end-users in the safe, durable and efficient use of timber and consequently increase its use in construction.

COST Action FP1006

Bringing new functions to wood through surface modification

Chair: Dr Stefanie Wieland, Salzburg University of Applied Sciences, Austria
Vice Chair: Prof. Bartlomiej Mazela, Poznan University of Life Sciences, Poland
Website: http://cost-fp1006.fh-salzburg.ac.at/
Start of Action: 13/04/2011
End of Action: 12/04/2015

Many applications of products are determined by their special surface properties, and based on the physical, chemical and biological interchange of various molecules with the materials surface. This is especially true for the use of wood and wood based products due to the special wood characteristics like anisotropy, UV-degradation. Thus, bringing new functions to wood through surface modification is needed in order to enhance the quality of the existing wood products and to open the way to new applications, products or markets. This COST Action aims to provide the scientific-based framework and knowledge required for enhanced surface modification of wood and wood based products towards higher functionalization and towards fulfillment of higher technical, economic and environmental standards. This will be achieved by working within three main areas: Wood surface modification and functionalization, Wood interface modification and interface interaction and Process and Service life modelling.

COST Action FP1004

Enhance mechanical properties of timber, engineered wood products and timber structures

Chair: Prof. Richard Harris, University of Bath, United Kingdom
Vice Chair: Prof. RobertKliger, Chalmers University of Technology, Sweden
Website: http://costfp1004.holz.wzw.tum.de/
Start of Action: 30/05/2011
End of Action:29/05/2015

Timber and wood-based engineered products are becoming very important as structural materials, especially in the drive towards sustainable technologies and construction. For structural wooden products, it is very important to improve their properties to be more competitive and reliable as a sustainable low-carbon material and a major contributor to affordable buildings. This applies particularly to larger, more complicated structures where timber is becoming a realistic alternative. This Action aims to boost the performance of structural timber products/construction, thereby improving use of timber in construction in existing and new applications. This includes the enhanced predictability and reliability of timber structures. Improving the mechanical performance of connections and reinforcing timber in weak zones are large-scale research domains in Europe which will require coordination and scientific/engineering approaches. This COST Action will deliver increased knowledge of improving strengthening, stiffening and toughening techniques, modelling enhanced performance and experience in real projects to create new opportunities for timber construction. Exchanging information will highlight gaps in knowledge and inform future work and potential collaboration between research groups, supporting timber construction and its wider uptake in the European construction industry. This Action may also create opportunities for patenting possible new technologies and products for reinforcing timber mechanical properties.

COST Action FP1001

Improving Data and Information on the Potential Supply of Wood Resources: A European Approach from Multisource National Forest Inventories (USEWOOD)

Chair: Dr AnnemarieBastrup-Birk,University of Copenhagen, Denmark
ViceChair: Dr KlemensSchadauer, Bundesamt und Forschungszentrum fur Wald, Austria
Website: https://sites.google.com/site/costactionfp1001
Start of Action: 8/10/2010
End of Action: 7/10/2014

The question of availability of wood in Europe on a sustainable basis is highly relevant to define global change mitigation strategies and targets for biomass energy as adopted at national and European level, and to support the proposal of an increased use of wood as a post-Kyoto decision. Future scenarios at EU-level highlight a deficit of wood supply compared to wood consumption of 47 Mm3 in 2005, 134 Mm3 in 2010, possibly reaching 436 Mm3 in 2020. Major issues to be clarified are the potential supply of tree biomass, trees outside the forest, and the economic, social and ecological conditions, which will determine the wood supply. This COST Action aims at improving information and methodologies on the potential sustainable wood supply based on the National Forest Inventories to reduce the given uncertainties. Such harmonized information is urgent to improve the calculation basis for decision makers in the forest, environment, and in the wood and energy sectors.

COST Action FP0904

Thermo-Hydro-Mechanical Wood Behaviour and Processing

Chair: Prof. ParvizNavi, Bern University of Applied Sciences, Switzerland
Vice Chair: Dr Dennis Jones, SP Trätek, Sweden
Website: http://www.cost-fp0904.ahb.bfh.ch/cost/en/home
Start of Action: 27/05/2010
End of Action: 26/05/2014

The main objective of this Action is to improve the knowledge on wood mechanical and physical behaviour and its chemical degradation during Thermo-Hydro-Mechanical (THM) processing, and its application to wide-ranging wood treatment systems. This Action will help overcome challenges related to the scaling-up of research findings and full industrial production, optimising processing conditions, improving product properties and developing innovative product ranges from the understanding of THM processing. The polymeric components of wood and its porous structure allow its properties to be modified under the combined effects of temperature, moisture and mechanical action – so-called Thermo-Hydro-Mechanical (THM) treatments. Various types of processing techniques, including high temperature steam with or without an applied mechanical force, can be utilised to enhance wood properties, to produce eco-friendly new materials and to develop new products. During these THM treatments, wood undergoes mechano-chemical transformations, which depend upon the processing parameters and material properties. An investigation of these phenomena requires collaboration between groups from different wood disciplines; however, to date research has been rather fragmented. This COST Action aims to apply promising techniques
in the fields of wood mechanics, wood chemistry and material sciences through an interdisciplinary approach to improve knowledge about the chemical degradation and mechanical behaviour of wood during THM processing. This will help overcome the challenges being faced in scaling-up research findings, as well to improving full industrial production, process improvement and the enhancement of product properties and the development of new products.

COST Action FP0802

Experimental and Computational Micro-Characterisation Techniques in Wood Mechanics

Chair: Dr Karin De Borst, Vienna University of technology, Austria
Vice Chair:Dr LennartSalmen, Innventia, Sweden
Website: http://cost-fp0802.tuwien.ac.at/
Start of Action: 7/11/2008
End of Action: 6/11/2012

The emerging techniques in the fields of physics, chemistry, materials and computer science bear an enormous potential for the investigation of wood materials. Their appropriate application will boost the state-of-the-art in wood mechanics. Highly sophisticated imaging techniques in combination with increasing computer processing power and memory capacities allow studying materials at always smaller length scales. This COST Action aims at exploiting the emerging experimental and computational techniques for improving the knowledge of microstructural features of wood and their relevance for the macroscopic material behaviour. Particular attention will be paid to the effects of moisture, load, temperature, and time on the mechanical behaviour. The increased knowledge of the hygro-thermo-mechanical behaviour of wood will result in a better predictability of the material properties and their changes over time and, thus, enhance the reliability of the material. Together with the improved characterisation techniques, the better

knowledge base will create new possibilities for the development and engineering design of innovative wood-based products in the future, starting off at the scale of the wood cell wall or its constituents. Stimulating the use of wood as a renewable and CO2 neutral raw material will contribute to a sustainable development in Europe. Keywords: wood and wood products, ultrastructure, (hygro-) mechanical properties, modelling, sustainability

COST Action FP0702

Net-Acoustics for Timber based Lightweight Buildings and Elements

Chair: Mr. Michael Villot, CSTB, France
Vice Chair: Dr Jean-LucKouyoumji, FCBA/CTBA, France
Website:http://extranet.cstb.fr/sites/cost/default.aspx
Start of Action: 26/08/2008
End of Action: 25/08/2012
The main objective of the Action is to improve the acoustic behaviour of timber based lightweight buildings as well as to develop effective prediction models and measurement schemes. There is an increasing interest in timber based lightweight components and buildings (TBLB) because of three important requirements. The raw material wood has to be used effectively because of its quantitative limitation and needs to be bounded in buildings for a long time in respect of CO2-storage regarding the global warming. Supplementary this type of construction allows an economic and very accurate industrial manufacturing. In general the acoustic performance of buildings and elements is an important topic in Europe but especially it is even more relevant for TBLBs due to their natural frequencies of resonance and the low mass of building material used in these elements. However, acoustic measurement procedures and characterizations of timber based components as well as the prediction of the acoustic performance in situ are research domains that still require further activities. This Action will aim at advancing the relevant technical knowledge and will contribute to the development of guidelines for TBLBs focusing on an improvement of their performance regarding acoustics and low frequency vibration behaviour. Keywords: sound insulation, building acoustics, flanking transmission, timber lightweight constructions, measurement methods.

COST Action E55

Modelling of the performance of timber structure

Chair: Dr. Jochen Kohler, ETH Zurich, Switzerland
Vice Chair: Dr. Annette Harte, University of Ireland, Ireland
Website: http://www.cost-e55.ethz.ch/
Start of Action: 15/12/2006
End of Action: 14/06/2011
The main objective of this Action is to provide the basic framework and knowledge required for the efficient and sustainable use of timber as a structural and building material. Focus is directed on the aspects of design, construction, assessment and maintenance of competitive and high performance timber structures. The Action mainly considers high performance structures where the load-bearing capacity is of predominant interest; for example, structures such as timber bridges, large-span halls and roofs, and also load-bearing elements of other types of timber structures.

COST Action E53

Quality control for wood and wood products

Chair: Prof. RobertKliger, Chalmers University of Technology, Sweden
Vice Chair: Dr Johannes Welling, Johann Heinrich von ThünenInstitut, Germany
Website: http://www.coste53.net/

Start of Action: 06/03/2006
End of Action: 05/03/2010
The main objective of this Action is to improve methods of quality control in processing of round wood and timber to ensure that timber products and components meet the requirements of the users. The Action will also promote the improvement of specifications for timber products and contribute to economic optimization of production so that the full environmental and sustainability benefits of the forestry wood chain can be realized.

COST Action E50

Cell wall macromolecules and reaction wood (CEMARE)

Chair: Prof. J.R. Barnett, University of Reading, United Kingdom
Vice Chair: Dr JosephGril, LMGC, France
Website: http://www.forestry.gov.uk/fr/cemare
Start of Action: 07/07/2005
End of Action: 06/07/2009
The main objective of the Action is to achieve a better understanding of the structure and biosynthesis of wood macromolecules like lignin, hemicelluloses and cellulose and their impact on wall assembly and wood properties, including reaction wood, for the development of new products based on wood

COST Action E49

Processes and Performance of Wood-based Panels

Chair: Dr Mark Anthony Irle, Ecole Superieure du Bois BP, France
Vice Chair: Ms Eleftheria Athanasiadou, Chimar, Greece
Website:http://www1.uni-hamburg.de/cost/e49/
Start of Action: 12/07/2005
End of Action: 11/07/2009
The main objective of this COST Action is the scientific-based advance of wood-based panels and their production processes towards higher technical, economic and environmental standards. Such improvement is essential if the sector is to meet future demands and competition from other materials and markets. Overall objectives and benefits The COST Action is an ambitious initiative which will provide a common platform for the key players in the European WBP community to:- Coordinate and conduct WBP research activities- Identify and address strategic scientific and technological problems, in a cohesive and integrated manner- Improve the understanding of industry needs by the academic research community- Broadening the knowledge basis to promote the development of innovative technologies in WBP production at the European level- Collate and analyse information on WBP related research activities and facilitate an effective and rapid European-wide sharing of research results- Inform the industry about available research capabilities, expertise and facilities andhow to access these- Stimulate the development of interdisciplinary approaches in WBP research- Provide information on national research programmes and possibilities in Europe- Strengthen the WBP sector to prepare for joint research projects at an European level- Increase financial involvement of industry in research with the academic community- Identify trade barriers to WBP caused by different national codes, standards, regulations and laws- Reduce the differences in interpretations of European standards- Develop strategies to increase the use of WBP, taking into account the inherent capabilities of the materials- Disseminate knowledge and information about WBP to the wider scientific and public community- Prepare an outlook of the future trends and developments in the WBP sector from European and

intercontinental point of view Scientific and technological objectives. This COST Action will facilitate activity in the following fields:- Enhance existing WBP and stimulate product innovations through a knowledge-based R&D approach- Optimise the ecological and technological properties of WBP- Improve automation and control technologies for all stages of the production processes- Minimise environmental impact of production processes- Adaptation/Modification of the production processes caused by external influences, e.g. raw material supply situation- Provide information on suitability of WBP for new and existing building systems- Improve techniques for modelling and simulation of WBP production and performance- Enhance the understanding of the relationships between process, structure and product performance on a micro and macro scale- Integrate fundamental research with applied science on WBP process technologies and products. All activities will be conducted against the background of current and future international markets (e.g., Europe, China, North America). Results of these activities will help the industry to reduce its costs and therefore improve its competitiveness.

COST Action E44

Wood Processing Strategy

Chair: Prof. Joris Van Acker, Ghent University, Belgium
Vice Chair: Prof. ArtoUsenius, VTT Technical Research Centre of Finland, Finland
Website: http://dfwm.ugent.be/woodlab/CostE44/
Start of Action:23/06/2004
End of Action:22/06/2008
The main objective of the Action is to increase the knowledge required to create a wood processing strategy in Europe. The secondary objectives aim to generate the identification of wood processing mechanisms producing solid timber products and wood based panels, to improve insight on forests and the use of the wood produced and to provide critical information on the future research needs for the forestry wood industry chain

COST Action E37

Sustainability through New Technologies For Enhanced Wood Durability

Chair: Dr Rolf-Dieter Peek,vTI, Germany
Vice Chair: Prof. Joris Van Acker, Ghent University, Belgium
Website: http://www.bfafh.de/index45.htm
Start of Action: 28/01/2004
End of Action: 27/06/2008
The main objective of the Action is to concentrate on the contribution of wood durability to sustainability through the development of systems for quality assurance and performance classification of modified wood and wood products as alternatives to wood treated with traditional preservatives. By this the Action seeks to improve and consequently to increase the cost-effective use of components manufactured from sustainably produced European timber, wood-based fibre, and recycled raw materials.

COST Action E35

Fracture mechanics and micromechanics of wood and wood composites with regard to wood machining

Chair: Prof. Stefanie Tschegg, Boku, Austria
Vice Chair: TBA

Website: http://www.boku.ac.at/physik/coste35/
Start of Action: 09/02/2004
End of Action: 08/02/2008
The main objective of the Action is to achieve a better understanding of the relationship between wood structure at the cellular level of the structure of wood composites respectively and the mechanical as well as the fracture performance of wood machining at the macroscopic scale. The COST Action will provide new co-operation and research on the fracture mechanical properties of wood and the correlating structural features.

COST Action E34

Bonding of Timber

Chair: Dr ManfredDunky, Dynea Austria GmbH, Austria
Vice Chair: Prof. GeorgiosNtalos, Technological Educational Institute of Larissa, Greece
Website: http://www.rrz.uni-hamburg.de/cost/e34/
Start of Action: 19/02/2004
End of Action: 18/02/2008
The main objective of this Action is to achieve improvement in bonding timber and wood towards a higher common technical, economic and environmental standard. In particular the Action aims to take into account specific issues as evaluation and examination of the technical potentials of bonding timber and wood, improvement of the quality of the European databases
on the technical, economical and statistical information concerning the overall topic of bonding timber and wood and to promote the development of appropriate systems for bonding timber and wood on a European level to optimize the use of wood resources.

COST Action E31

Management of Recovered Wood

Chair: Dr Gerfried Jungmeier, Joanneum Research Forschungsgesellschaft mbH, Austria
Vice Chair: Dr BengtHillring, University of Uppsala, Sweden
Website: http://www.ctib-tchn.be/coste31.htm
Start of Action: 21/11/2002
End of Action: 20/05/2007
COST Action E31 Management of Recovered Wood addressed different aspects of using Recovered Wood as raw material or energy carrier with the aim, to develop and improve the management of Recovered Wood towards a higher common technical, environmental and economic standard in Europe. The main target was to develop strategies to avoid landfilling and waste incineration without energy use of Recovered Wood. 22 countries were taking part in this COST Action to advance the methodology for environmental, technical and economical evaluation of different Recovered Wood treatment options. A special focus was put on the Amounts of Recovered Wood in the member countries Action E31. For the first time an estimation of the amount of Recovered Wood in 20 out of 22 member countries could be made: about 30 Mio tons of Recovered Wood are produced annually which corresponds to about 13 of the annual round wood consumption of 227 Mio tons and about 444 PJ/a or 0.7 of the primary energy consumption of 67,000 PJ/a. Currently, 34 of Recovered Wood is used for energy generation, 38 is being recycled and 28 is being composted or put into landfills.

Thus, already 11 Mio. tons CO2-emissions per year can be saved through the substitution of fossil fuels and approx. 10 Mio. tons of fresh wood can be saved. Furthermore, Action E31 gave a comprehensive overview on the different management options for Recovered Wood and on available data on the different Recovered Wood assortments in Europe with focus on market prices and measurement methods to determine quality aspects of Recovered Wood (e.g.: sampling methods). The already existing data base could be expanded and tools for the comparison of different management options for Recovered Wood were analysed. All the important results of the scientific work carried out by this Action were presented in three conferences and compiled in the relevant proceedings. These conferences brought together international experts in the field from all over the world, including USA and Japan. Joint activities with COST E37 (Sustainability through New Technologies for Enhanced Wood Durability), IEA Task 38 (Greenhouse Gas Balances of Biomass and Bioenergy Systems) and InnovaWood were carried out to exchange experiences and to create common perspectives. A webpage was set up (http://www.ctib-tchn.be/coste31/frames/f_e31.htm) to disseminate the information generated by COST Action E31.

COST Action IE0601

Wood Science for Conservation of Cultural Heritage (WoodCultHer)

Chair: Prof Luca UZIELLI (IT)
Vice Chair: Dr Joseph GRIL (FR)
Start of Action: 18/04/2007
End of Action: 17/04/2011
Website: http://www.WoodCultHer.org

Main objective The main objective of the Action is to improve the conservation of our wooden cultural heritage by increasing the interaction and synergy between wood scientists and other professionals applying wood science and technology towards the study, conservation and restoration of wooden artefacts of artistic or historic interest (WCHOs, i.e. Wooden Cultural Heritage Objects). Specific objectives may be identified as follows: General - To put into evidence how the modern scientific knowledge about wood may contribute to Diagnosis and Conservation of wooden Cultural Heritage. - To favour meeting and interaction, at both scientific and practical level, of researchers in the field of wood, specialists in conservation of wooden artworks, manufacturers of equipment and products which might be successfully used for the diagnosis, restoration and conservation of wooden artworks. - To acquire a deeper insight into several fields and processes concerning wood material (e.g. the ageing processes, their factors – physical, mechanical, biological, chemical, environmental – and their interactions), in order to improve the conservation of wooden artworks. - To develop criteria for evaluating durability of interventions during very long time (centuries). - To develop criteria for ensuring “re-treatability” (i.e. that present interventions will not impede future interventions, if and when needed). Wood deterioration - To develop new methods for the evaluation of new techniques and products for the conservation of wooden artworks. - To acquire further understanding of the process of bacterial wood degradation in order to develop practical conservation methods to preserve historical wooden structures and remains in the soil. - To further develop micro waves as a conservation method against insect degradation. Diagnostic methods and equipments - To develop and foster the implementation of the use of practical sensors to indicate risk to wooden objects in museums and at historic sites, or during the transportation of artworks. Interactions between wooden artworks and environment - To be able to better evaluate the interactions between individual wooden artworks and environment, also by direct monitoring physical changes and damage processes in objects. Dendrochronology - To stimulate the development of non-destructive high resolution scanners for in situ inspection of

wooden objects to identify aging and degradation processes, that also allows tree-ring analyses (dendrochronology) for exact age determination. - To disseminate results which obtained by applying "dendro-provenancing" techniques, in order to support further historical and technological studies. Non-destructive inspection of wooden objects - To further develop non-destructive methods and equipments, for inspection and evaluation of both movable and non-movable WCHOs. Numerically modelling of risk of damage - To develop and validate mathematical models and computer simulations of short- or long-term phenomena, from the observation of past events and processes, aiming towards prediction of future behaviour. - To develop methods for predicting by simulation the long-term result of present interventions (e.g. present tendency to provide panel paintings with flexible cross-ties or frames). Long-term behaviour and "accelerated ageing" - To further explore specific subjects such as the properties and behaviour of "old" wood, the influence of ageing on the properties of WCHOs. - New principles, criteria, observation and evaluation methods need therefore to be developed in order to evaluate expected deterioration of WCHOs in the very long term. - To acquire knowledge and establish methods for studying deteriorations that take place during very long time periods (decades and centuries), and for evaluating the long-term compatibility of interventions, treatments, products, aiming to improve the conservation of wooden artworks. - To develop adequate models of the ageing and deterioration processes, deriving from the observation of past events and processes, aiming towards prediction of future behaviour. Archaeological and archaeo-botanic wood - To improve prevention of bacterial decay of wood in foundation piles and archaeological sites. - To develop methods and standards for evaluating procedures and products for conservation of archaeological and archaeo-botanic wood. Timber structures - To develop specific safety factors for verification of WCHO timber structures. - To develop appropriate load tests for WCHO timber structures. - To produce guidelines about criteria for conservation (and reinforcement, if necessary) of WCHO timber structures. - To produce guidelines and standard documents concerning (for various situations and types of structures) inspection, assessment of load-bearing capacity, use of visual versus instrumental methods, practices and responsibilities. - To develop criteria for evaluating effectiveness and durability (during very long time, i.e. centuries) of interventions performed on WCHO timber structures. - To foster development of national or local grading rules for existing “old” timber structural elements; to encourage, make available and compare results of test campaigns aimed to determine reliable strength and stiffness values for such timbers. Wooden foundations - To improve knowledge and techniques appropriate for conserving wooden foundations piles under historical buildings. - To increase knowledge on the process of bacterial wood degradation under water (e.g. ship wrecks, foundations piles), and to define strategies to control the soil hydrology or water streaming in open water leading to a reduction or even to stop the wood degrading bacterial activity. Standardization - To put in active contact the European scientific communities dealing with conservation of wooden Cultural Heritage, in order to provide a very strong and wide scientific background, and an informed consensus throughout European countries, for standardization (particularly of CEN/TC 346) in the field of wooden artworks. - To contribute to European Standardization in the field (inputs to CEN/TC 346 "Conservation of Cultural Property") - It should be emphasized here that since in the field of Cultural Heritage each artwork – especially if made of wood – is different (materials, wood species, manufacture, history, environment(s), decay/deterioration, interventions, …), each artwork needs/deserves a "personal" care, i.e. individual assessment, evaluation, solutions; therefore the technical standards should specify methods and criteria, not "standard solutions" to problems.