
PERFORMANCE OF BIO-BASED BUILDING MATERIALS – VIEWPOINTS FROM THE FIRST YEAR OF COST ACTION FP1303



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What is COST?

COST is the oldest and widest European intergovernmental framework for transnational Cooperation in Science and Technology.

For 40 years COST has supported networking of research activities across all its Member countries (36 today) and beyond.

COST is open to all disciplines, to all novel and ground-breaking S&T ideas, to all categories of partners, to the world where mutual benefit is real.

What is the mission of COST?

COST enables breakthrough scientific developments leading to new concepts and products.

It thereby contributes to strengthen Europe's research and innovation capacities.



COST Countries



- The 28 EU Member States
- EU Acceding & Candidate Countries
 - Former Yugoslav Republic of Macedonia
 - Iceland
 - Republic of Serbia
 - Turkey
- Other Countries
 - Bosnia and Herzegovina
 - Norway
 - Switzerland
- COST Cooperating Country
 - Israel

Forests, their Products and Services (FPS)

FPS has the mission to promote research along the whole forest wood chain by providing a platform for effectively coordinating nationally-funded research activities in the areas of forestry, wood technology, and pulp and paper.

Key areas:

- Forestry Research
- Forests and Environment
- Wood technology
- Pulp and Paper
- Bioenergy from forests



What a COST Action can offer

- Each COST Action is set up in a way to help promote research and cooperation.
- National experts from each participating country (nominated by national representatives to COST) who act as information providers to their country, ensuring widespread dissemination of information.
- Organising regular workshop conferences and specialised meetings on subjects related to ongoing activities in the Action.
- Provide a range of activities aimed in particular at Early Stage researchers (persons who gained their PhD within 8 years)

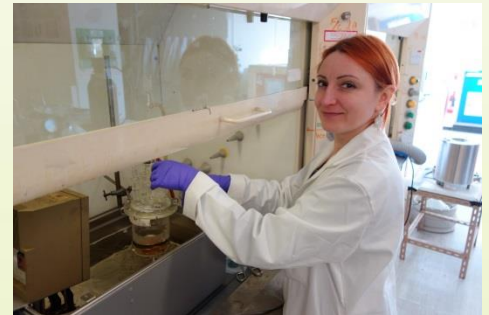
Meetings

- **MC Meetings** – which help define the Action strategy
- **Working Group Meetings** – focussing on the work in the Scientific Objectives of the Action (Action MoU)
- **Core Group Meetings** – which help prepare management committee decisions
- **Action Workshops / Action Conferences** – Open to the scientific community to showcase activities
- **Dissemination meeting (attendance to other conferences)** – a maximum of 2 persons per Grant Period can do this
- **Final Workshop / Conference** – to report the Action achievements and mark the end of the Action



Short term Scientific Missions

- Mainly intended for young scientists
- Theme is to provide researcher with methods, knowledge and facilities not available at home institute
- Evaluated on an individual basis
- Duration can be from one week (5 working days) to 3 months
- Typically grants up to €2500 for travel, accomodation and meals
- Participants must be from a country that has joined the Action
- Participants must go to a centre in a country that has joined the Action
 - Full member country, Near-neighbour country, International Partner Countries



Training Schools

- Provide intensive training on a subject that contributes to the aims of the Action
- Typically Training Schools between 3 days and 2 weeks duration
- Fixed grants paid to trainees (from COST participating countries)
- Normally 20-30 persons in each Training School
- 2-3 invited trainers
- Combination of theory and practical work



*FP1303 Training School
"Durability studies in the
field". June 2014*

Reasons for COST Action FP1303

Increasing building performance

- Controlled air exchange
- Limited heat loss
- Greater thermal efficiency of building design
- Advancing issues related to indoor air quality



etc...

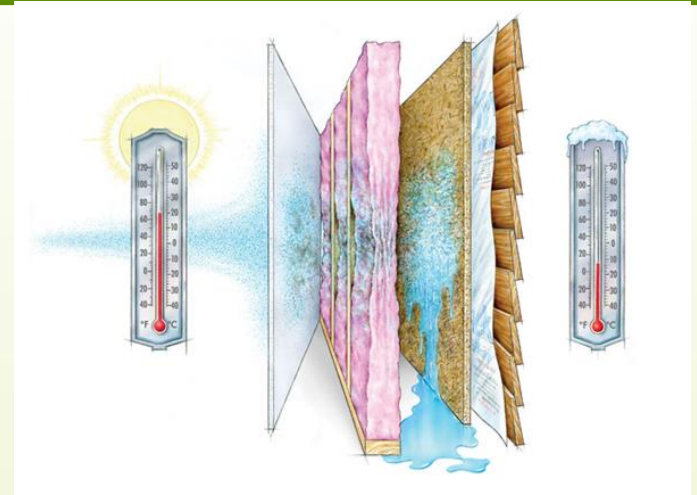


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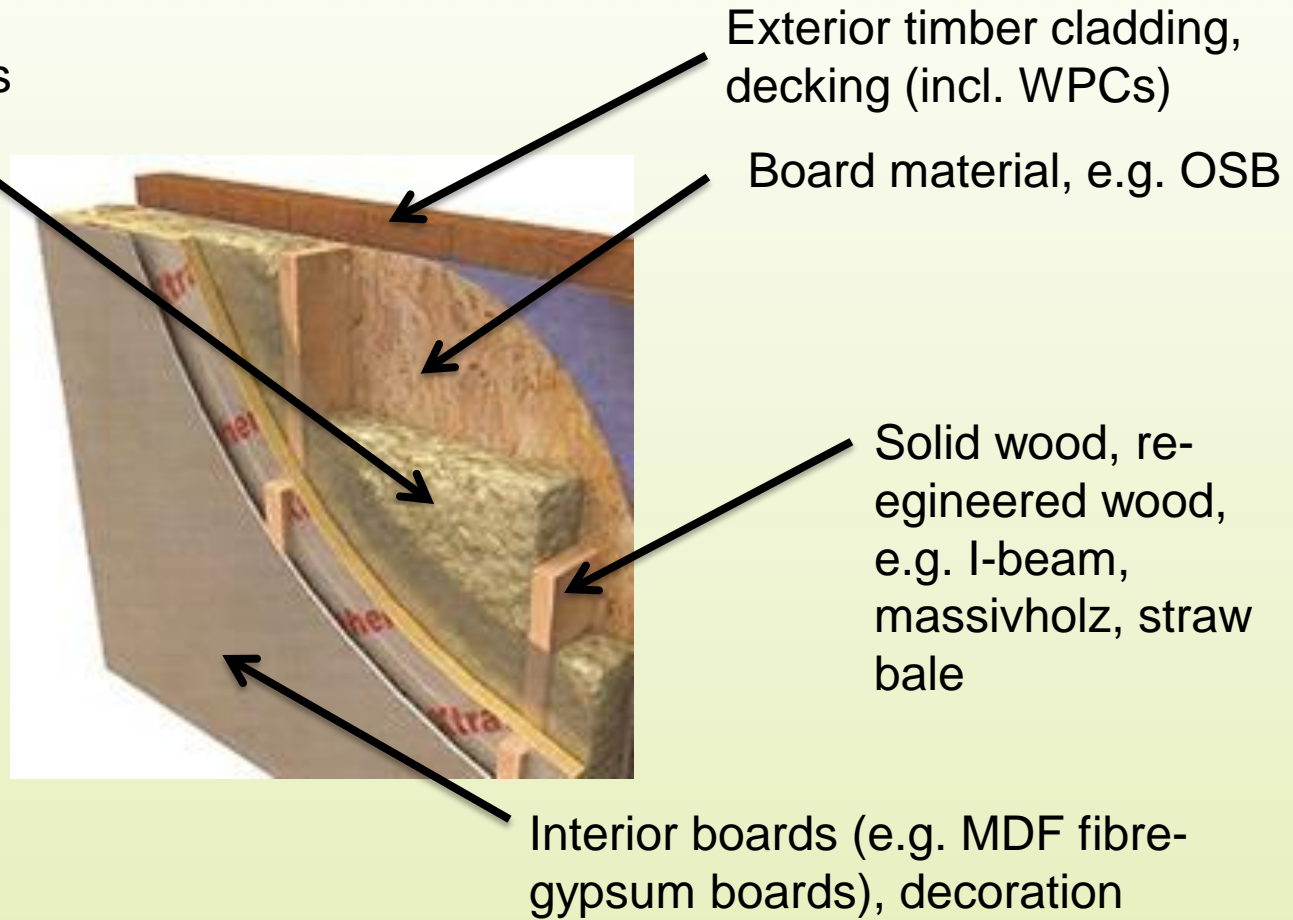
First three can create issues with moisture, both internally and externally



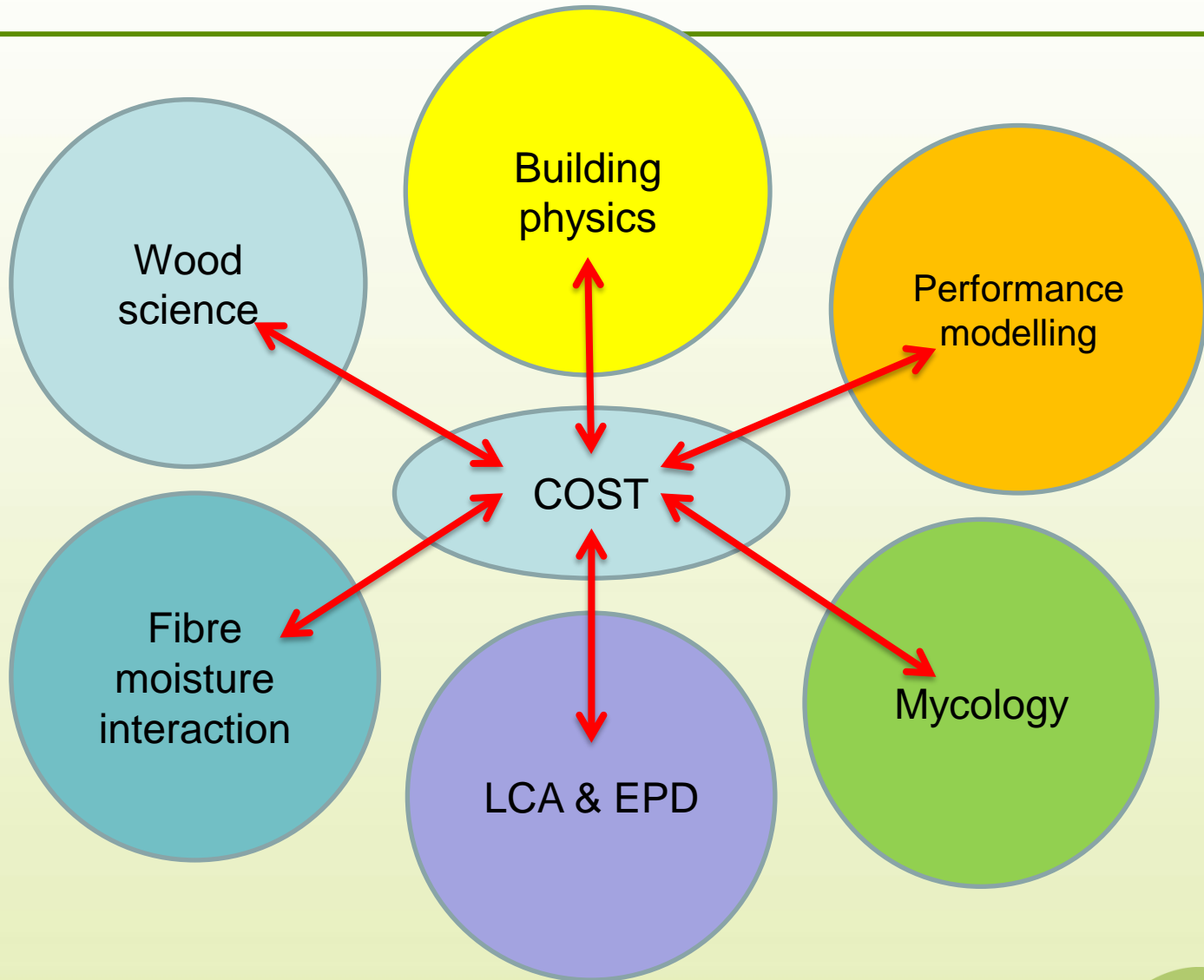
What are bio-based building materials?

Products derived from natural materials

Natural fibre insulations



National/international interest – where we want to be



How is this Action different from others?

Previous Actions

Focus on decay prevention

Material focus

Wood only

This Action

Wider material range

Materials in use

Stakeholder driven

Material acceptance

Consumer preference

- Apart from having the aim to **INCREASE THE KNOWLEDGE** this Action will raise the awareness across a wider scientific community and associated industries of the potential of using wood and plant fibre products where performance and service life are critical parameters.

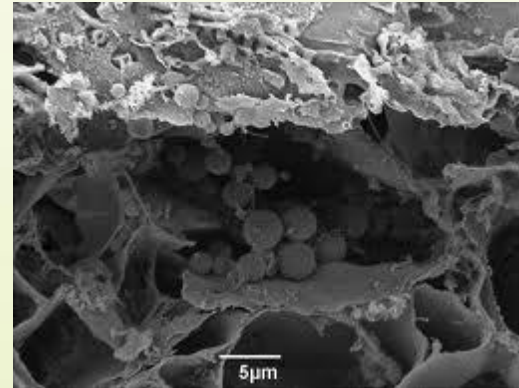
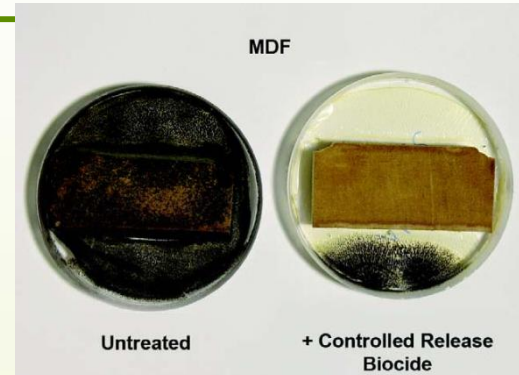
Working Group 1

Material capability and enhancement

Main topic: achieving a better fundamental understanding of substrate decay organism interactions.

Methods: Aspects of rot, staining and fungi; Factors related to degradation; Understanding role of gene expression; Protection and remediation programmes

Deliverables: Better understanding of onset of decay, its prevention/remediation. Differences in materials, climatic conditions.



Working Group 2

Functionality and performance

Topics: whether a material is fit for purpose, service life performance, specific effects

Methods: Identifying aspects of building physics; Increasing understanding of fibres and moisture; Assessing and developing service life models; Modelling performance; Considering link between models and building performance.

Deliverables: Better understanding of how materials perform; Analysis methods; Linking chemistry, biology and physics



Working Group 3

Adaptation and application

Topics: linking preferences of end users with those of manufacturers (stake-holders), issues related to volatile releases

Methods: Life cycle methods; EPD and CE certification; Environmental effects; Converting results into literature; Marketing

Deliverables: How to promote the benefits of bio-based materials; Greater environmental awareness; Common agreement on performance for stake-holders; Better advice for supplier and end-users



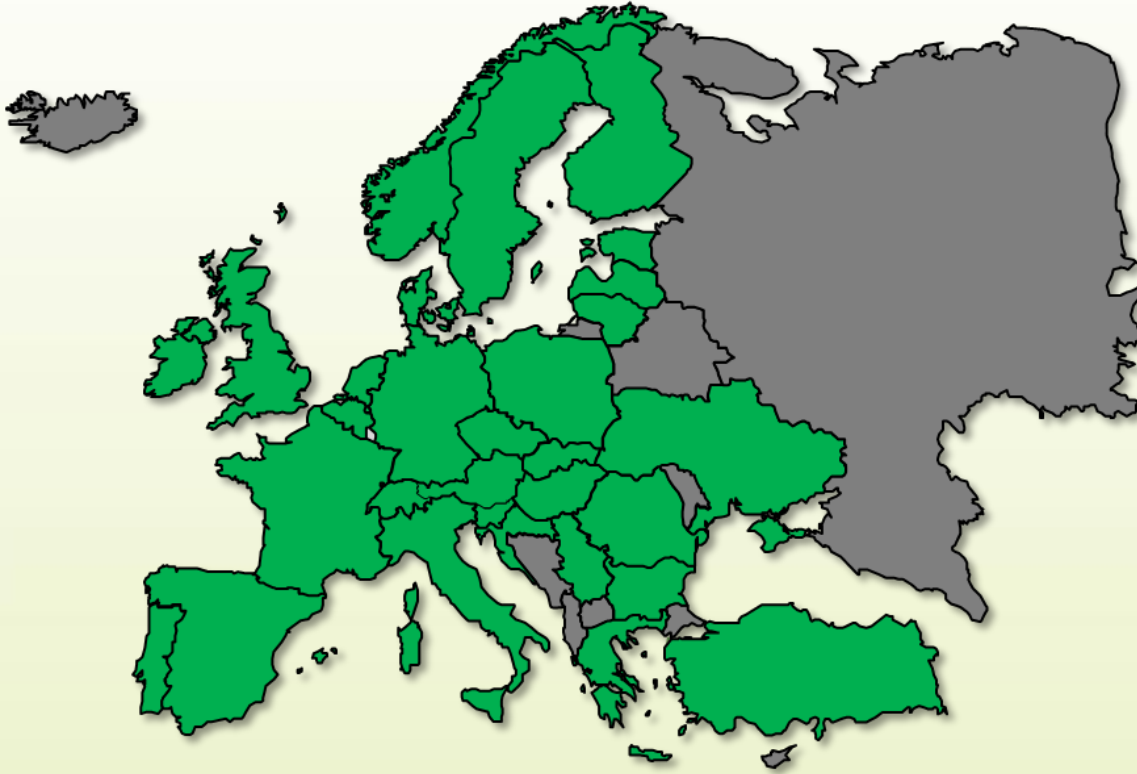
Outcomes from the Action

- Create a new network of scientists from various disciplines, who traditionally do NOT working together
- Dissemination of knowledge to alleviate consumer misconceptions and misunderstandings regarding release of volatiles and the presence of mould growth, decay and other damage caused by organisms.
- Guidelines for preventing building indoor and outdoor surfaces and the building envelope from mould growth and staining fungi.
 - *performance data base, for a wide range of natural building materials*
- Establish performance guidelines related to indoor air quality
- Improved and harmonized assessment protocols and procedures for various bio-based building materials linking materials to building physics.
- Overviews and recommendations on available and implementation of novel protection methods.
- Initiation of combined efforts to develop new protection technologies.

Specific outcomes

- Establish and maintain a data-base of performances of natural building materials
- Provide guidance on material use and maintenance
- Generate and make available online reports and documents for advancing education and codes/standards
- Bring together knowledge of previous and ongoing COST Actions
- Focussed outputs aimed towards codes and standards
- Create focus groups for material combinations / performance in service
- Develop a pan-European approach to how natural building materials are used

Current members FP1303



29 EU countries taking part at present (shown in green):

AT, BE, BG, CH, CZ, DE, DK, EE, ES, FI, FR, GR, HR, HU, IE, IT, LT, LV, NL, NO, PL, PT, RO, RS, SE, SI, SK, TU, UK

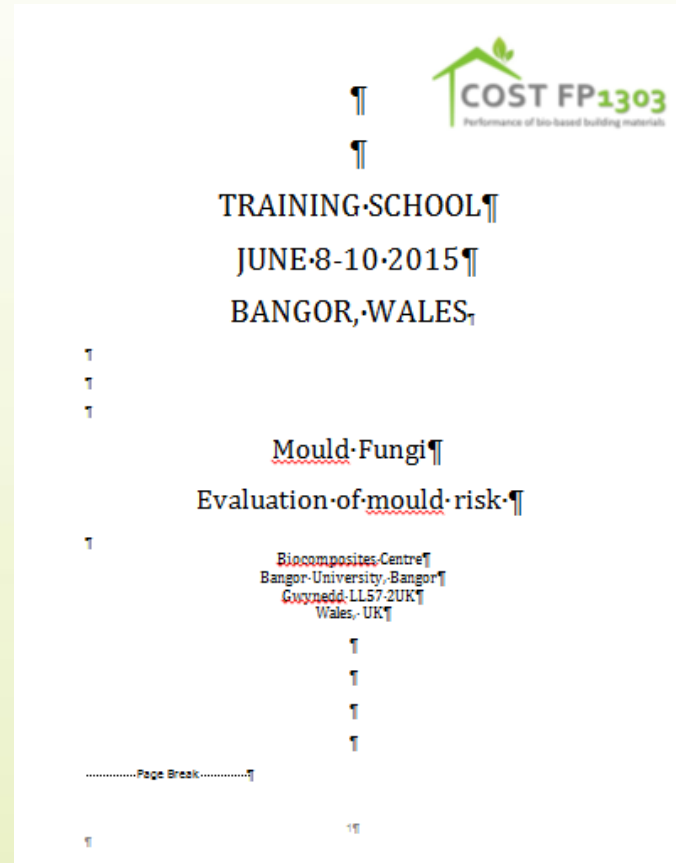
Ukraine
New Zealand
(Kosovo)

Any country can join! Need to make formal application!!

Important texts to aid study



38 pages

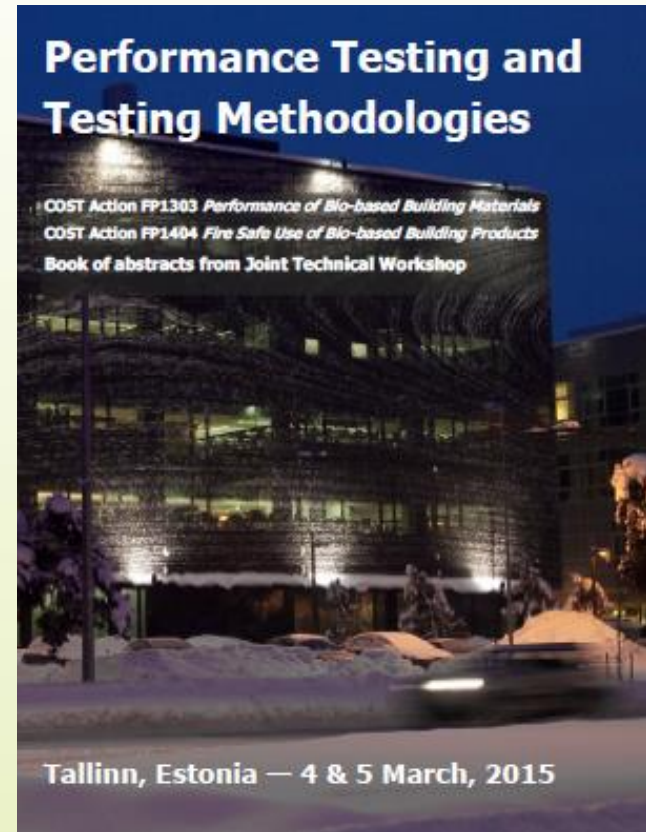


35 pages

Wide range of subjects presented

General description of theme of presentation	Number presentations to date (up to 5 March 2015)
Moisture effects	17
Mould and aesthetics	8
Fungal colonisation and decay	12
Composite materials	13
Testing and monitoring	9
Environmental declarations and LCA studies	13
Materials use and design	4
Human 'well-being'	5
Material performance	14
Insulation material	5

Proceedings from meetings



Training

Short Term Scientific Missions

Planned number for 2013/2014: 10

Cost: €24 000 (average €2 400 each)

This number could increase on reallocation of unused grant.

Training School – VOCs: issues and analysis

Location: To be determined

Date: May-June 2016 (to be confirmed)

To be organised by Martin Ohlmeyer

Future meetings

- October 26-27, 2015: Helsinki (ECWM8)
- December 6, 2015: LCA Forum, Zurich, Switzerland
- February 2016: Madrid, Spain
- May 2016: Lisbon, Portugal (IRG)
- September 2016: Poznan, Poland
- March 2017: Greece (venue to be decided)
- October 2017: Stockholm, Sweden (final conference)

Selection of Steering Committee

Chair:	Dennis Jones (SE)
Vice Chair:	Christian Brischke (DE)
Grant Holder:	SP (SE)
WG1 leader:	Lina Nunes (PT)
WG1 deputy leader:	Stig Bardage (SE)
WG2 leader:	Sabrina Palatini (IT)
WG2 deputy leader:	Miha Humar (SI)
WG3 leader:	Andreja Kutnar (SI)
WG3 deputy leader:	Ed Suttie (UK)
STSM officer:	Carmen-Mihaela Popescu (RO)

Action Brochure

Will be available through the web site...



EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

COST Action no. FP1303

Performance of bio-based building materials

22 October 2013 | 21 October 2017

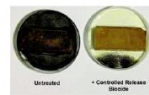


Background

The development of building materials incorporating bio-based materials is also an area of rapid development. As well as solid timber, wood-fibres and other materials, such as bamboo, miscanthus, phragmites, and other gramineae are now being used for structural purposes as well as for roofing and cladding. However, whenever and wherever organic material is exposed to favourable moisture and temperature conditions as well as to degrading organisms its functional and aesthetic service life might get negatively affected.

There is a need to establish better links between research and industry in understanding the issues affecting the performance of bio-based materials in construction, and what factors can help address avoiding issues around moisture entrapment in modern buildings. This COST action will provide the platform demanded by industry, academia and end-users for scientific exchange and collaboration and help identify where key activities need to be undertaken in future collaborative programmes between participants.

Working Group 1: Material capability and enhancement



- Achieving a better fundamental understanding of substrate decay organism interactions
- Aspects of rot, staining and fungi
- Factors related to degradation
- Understanding role of gene expression
- Protection and remediation programmes

Working Group 2: Functionality and performance



- Identifying aspects of building physics
- Increasing understanding of solid materials / fibres and moisture
- Assessing and developing service life models
- Modelling performance of materials
- Considering link between models and building performance

Working Group 3: Adaptation and application



- Linking preferences of end users with those of manufacturers
- Life cycle methods, EPD and CE certification
- How to promote the benefits of bio-based materials
- Greater environmental awareness
- Common agreement on performance for stake-holders
- Better advice for supplier and end-users

www.cost.eu/fps



Forests, their Products and Services (FPS)

Participating countries to date

BE, BU, CH, DE, DK, EE, ES, FI, FR, GR, IE, LV, NL, NO, PL, PT, RO, SI, SE, TR, UK

Contact details

Proposer / Chair of the Action

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Science Officer

Science Officer Forests, their Products and Services
COST Office
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Training school on cladding installation (courtesy of WoodKnowledge Wales, UK)



Poor maintenance can affect performance (courtesy of SP, SE)

Website: <http://www.costfp1303.com>



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ESF provides the COST Office through its European Commission contract

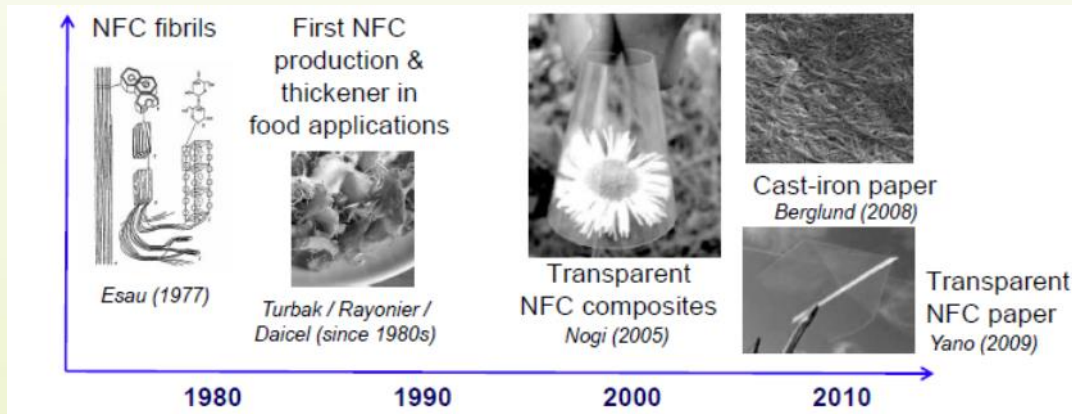
Website

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COST FP1205

Innovative applications of regenerated wood cellulose fibres

23 May 2013 - 22 May 2017



Chair of Action
Åsa Östlund
Asa.ostlund@sp.se



COST FP1404

Fire safe use of bio-based building products

05 December 2014 - 04 December 2018



Chair of Action
Joachim Schmid
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Thank you and Contact

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