



Building European Science



Action E55:

Modelling of the Performance of Timber Structures

5th Workshop and 7th MC Meeting
Norwegian University of Science and Technology
Trondheim, Norway
26.-27. March 2009

Discussions on the following topics:

- Moisture induced stresses
- Ductility of timber connections
- Robustness of timber structures

Local Organiser:

Professor Kjell Arne Malo

Department of Structural Engineering
Faculty of Engineering Science and Technology
Norwegian Univ. of Science and Tech., NTNU
Rich. Birkelandsv. 1a
7491 Trondheim
Norway



Co-ordinating Contact Office
through an EC contract

<http://www.cost-e55.ethz.ch>

<http://cost.esf.org>



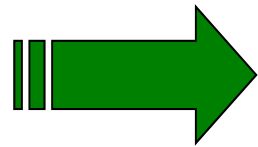
COST is supported by the EU, NTU
Framework programme

Introduction

- The Action Layout
- Motivation and Objectives
- Where do we stand ?
- Today and Tomorrow
- Perspectives and Outlook

The Actions Layout – COST in general

- What is funded by COST ?



- Meetings, Workshops and Seminars (Travel expenses)
- Short Term Scientific Missions (STSM)
- Publications
- Actions' Management

- Research is not directly financed, but – communication and dissemination is facilitated !


The Actions Layout – COST in general

- The “COST Win Win” situation
 - We as individual researchers get the possibility to exchange our expertise and findings.
 - We attempt to condense the added value in form of documents.
 - The research community and consequently the society takes benefit from our collaboration.

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The Actions Layout – COST E55



The poster features the COST logo at the top left, with the tagline 'Building European Science' and a small tree icon. Below this are three checkmarks with the words 'Bottom-up', 'A la carte', and 'Flexibility'. A paragraph of text describes COST's mission. The central part of the poster is titled 'Action E55: Modelling the Performance of Timber Structures' and lists the chair and major objectives. At the bottom, there are three images: a forest, a timber dome structure, and a close-up of timber joints, each with a caption: 'Sustainable Resource', 'Efficient Structures', and 'High Performance'. Logos for the European Science Foundation and the European Union are at the bottom left and right, respectively. Two URLs are provided at the bottom center.

cost
Building European Science

✓ Bottom-up ✓ A la carte ✓ Flexibility

COST is one of the longest-running instruments supporting cooperation among scientists and researchers across Europe. COST now has 35 member countries and enables scientists to collaborate in a wide spectrum of activities in research and technology.

Action E55:
Modelling the Performance of Timber Structures

Duration: 2006 - 2010 Chair: Jochen Köhler, Switzerland

Major objectives:

- to provide the basic framework and knowledge required for the efficient and sustainable use of timber as a structural material,
- to improve the understanding of timber and timber products, such as glued laminated timber, as well as the understanding of connections for efficient and reliable use in production and service,
- to assess robustness and system aspects of timber structures.

Sustainable Resource Efficient Structures High Performance

EUROPEAN SCIENCE FOUNDATION <http://www.cost-e55.ethz.ch> <http://cost.esf.org>

- Started at December 15, 2006 – duration 4 years.
- Researchers from 18 European countries are participating.
- The work within the action is structured in 3 Working groups.

Motivation and Objective

The main objective of the Action is to provide the basic framework and knowledge required for the efficient and sustainable use of timber as a structural and building material.

-> Modelling / Prediction of the structural performance

Motivation and Objective

The Performance of Timber Structures

Derived from ,End-User requirements`:

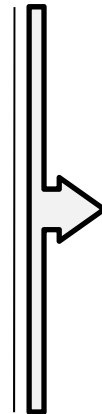
- Reliability
- Serviceability
- Durability
- Good Value for Money
- Good Appearance

Motivation and Objective

The Performance of Timber Structures

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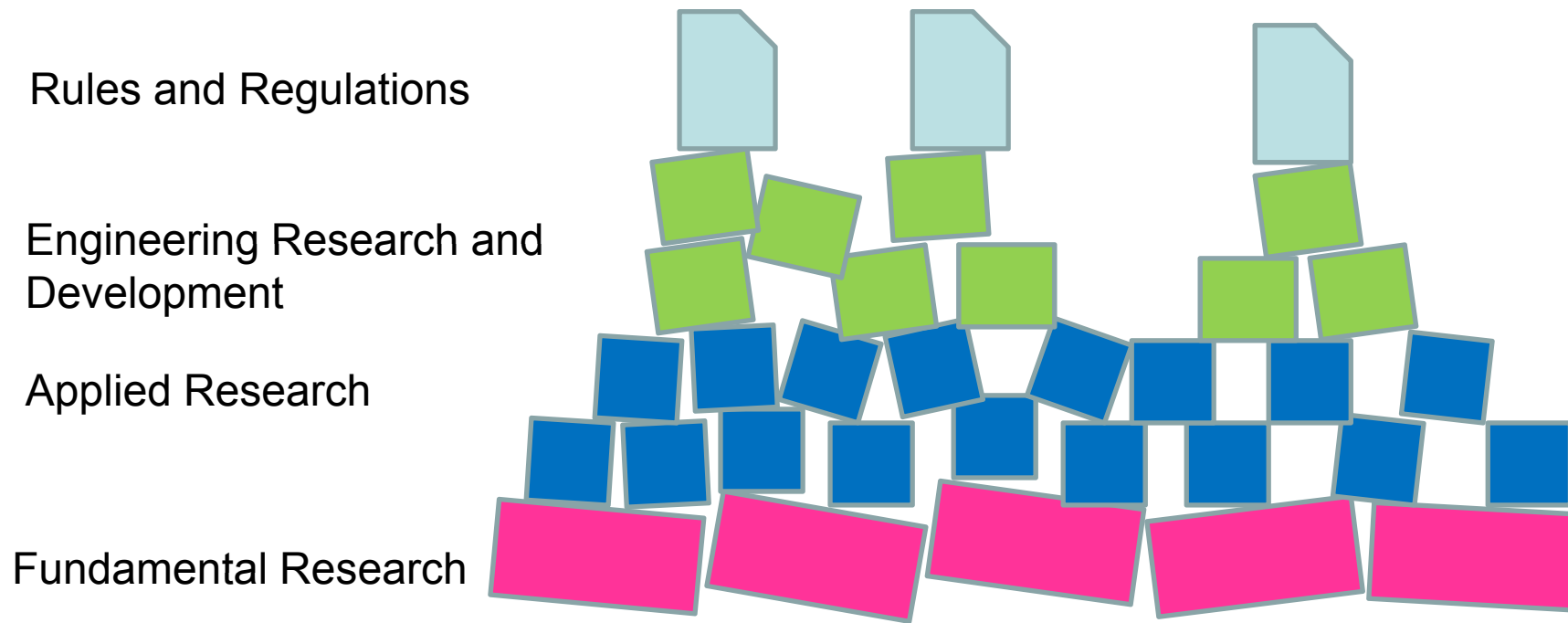
Good performance is attempted by following `best practices`, i.e.:

- codes and regulations
- `state of the art technology`

`best practice` is by nature subject to revision and development.

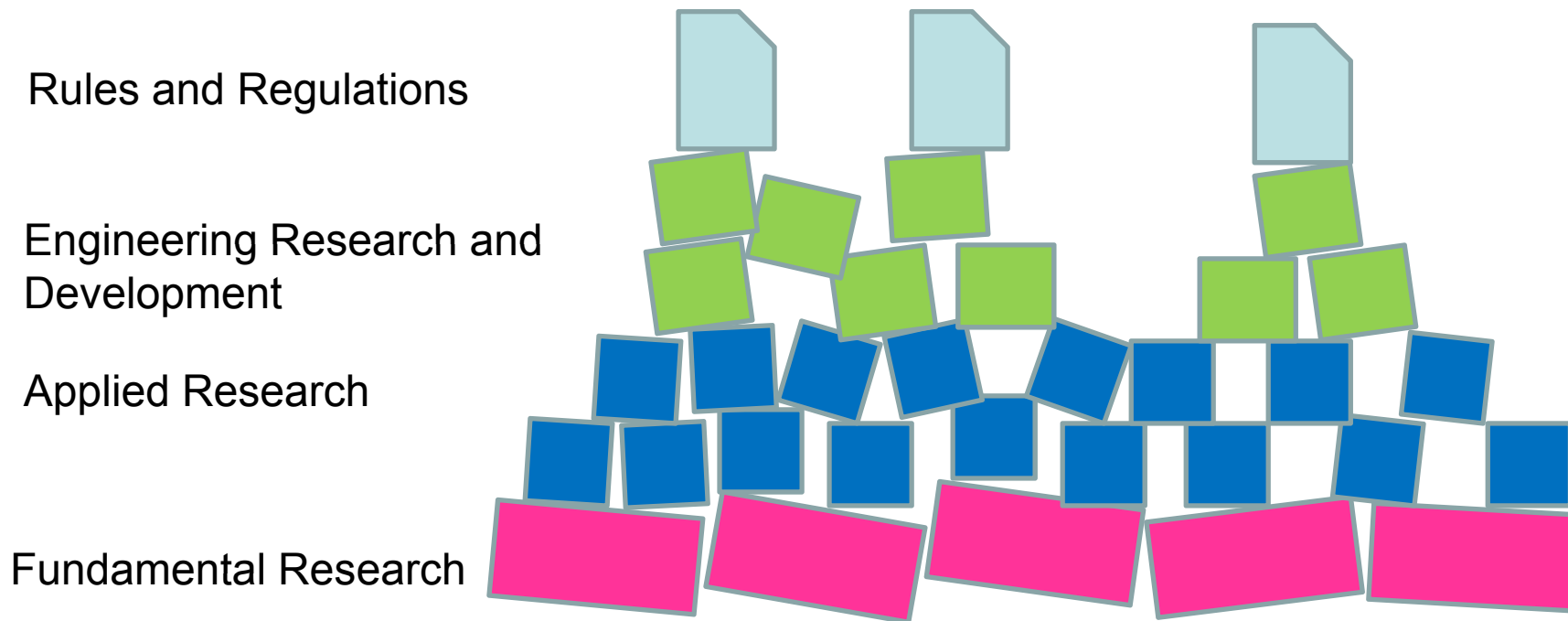
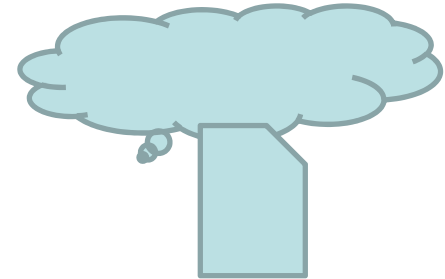
Motivation and Objective

Research and best practice



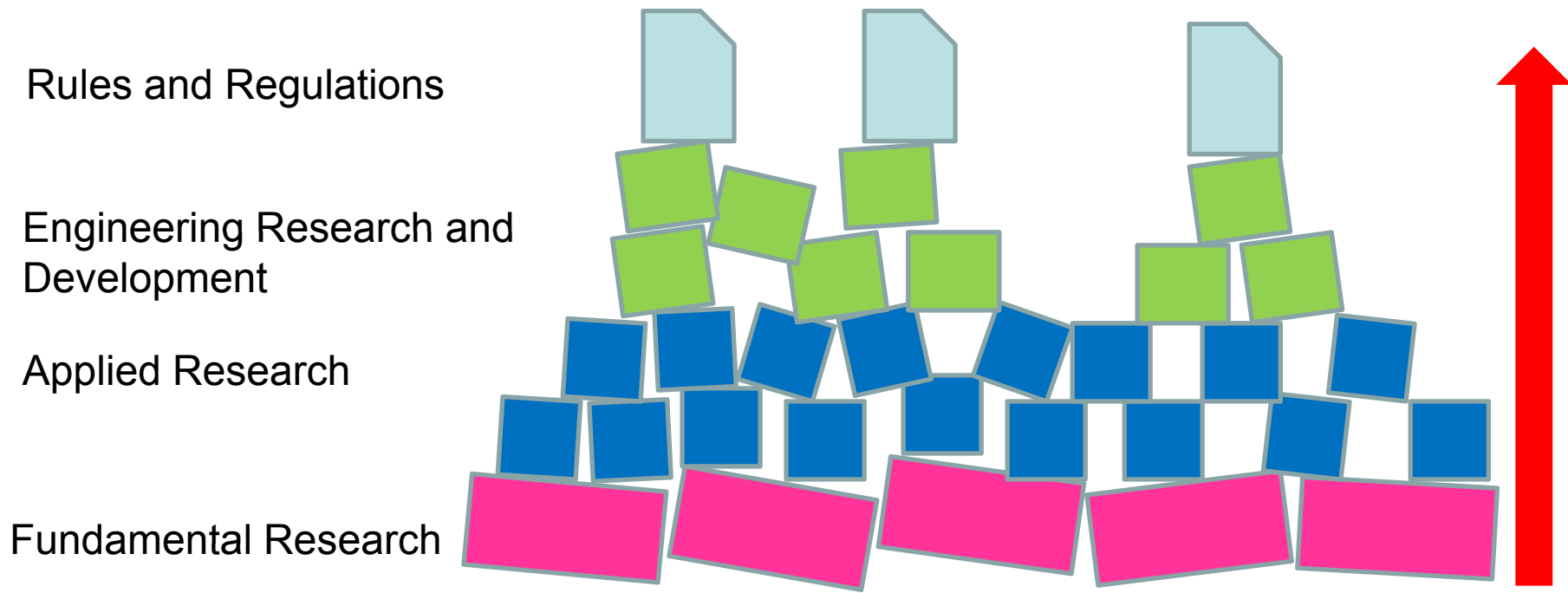
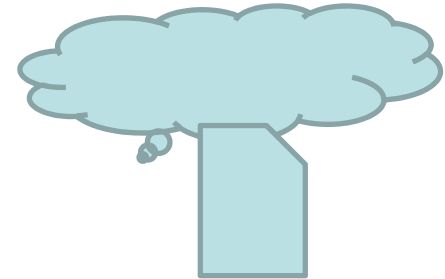
Motivation and Objective

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Motivation and Objective

Research and best practice



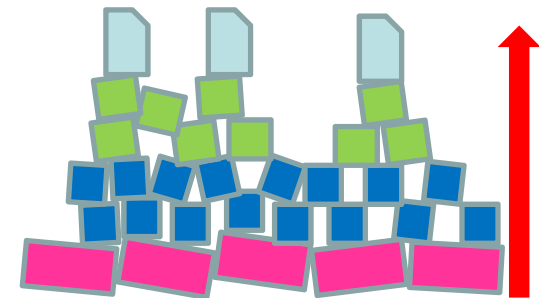
Motivation and Objective

The aim is to enhance the basis of modeling and design of high performance structures.

The working mode is:

meet, exchange, work, develop, publish

<<Let's add another building stone ! >>



Where do we stand ?

Meetings:

- | | |
|---------------|--------------------------|
| December '06 | 1. MC, Brussels |
| February '07 | 2. MC, Zurich |
| May '07 | 3. MC / 1. WG, Graz |
| October '07 | 4. MC / 2. WG, Eindhoven |
| March '08 | 5. MC / 3. WG, Helsinki |
| September '08 | 6. MC / 4. WG, Zagreb |

STSM:

- | | |
|-------------|---------------------------------------------------------------|
| April '07 | Monitoring of biodegradation (NL -> I) |
| Sept. '07 | Non-destructive/ destructive testing of round wood (NL -> PT) |
| October '07 | Floor Dynamics (UK -> FI) |
| January '08 | Load bearing behaviour, dowel type fasteners (NL -> DK) |

Communication and Dissemination instruments:

- Actions Homepage
- Brochure, Poster

Where do we stand ?

Publications:

Presentation of Delegations, issued '07

Analysis of Failures / Failure classification template, planned

Robustness, Evaluation Guideline, planned

Scientific papers

4 STSM reports

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This is how our work may impact current developments

- and how our work will be assessed !!!

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Again, the working mode is:

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Today and Tomorrow

- The set up of today and tomorrow is clearly based on the needs identified in our previous meetings:
 - Going beyond “meet and exchange”
 - Take the chance to “meet, work and develop”
 - Follow up and initiate discussions which may lead to publishable results
- The identified topics are:
 - Moisture induced stresses
 - Joint ductility
 - Robustness evaluation

Today and Tomorrow

- The schedule:

Now	Opening and workshop overview
09.30	Parallel Sessions
12.30	Lunch
13.30	Parallel Sessions
18.00	Closure
19.00	Dinner

Friday

08.30	Reliability of Structures (A. Næss)
09.15	Timber Engineering Research in NZ (P. Quenneville)
10.15	Parallel Sessions (I. and II.), Conclusions
11.00	Joint Session (III.), Conclusions
12.00	Lunch
13.00	Joint Session, Discussion and outlook
14.30	WS Closure, Coffee
15.00	MC meeting
16.30	End MC meeting

Today and Tomorrow

- The sessions:

Moisture induced stresses (coordinated by Staffan Svensson)

- Representing Indoor and Outdoor climate, Data and Modelling
- Modelling the hygro-mechanical behaviour.
- Modelling moisture transport in wood.
- Case studies related to the above mentioned topics.

Ductility of Timber Connections (coordinated by André Jorrissen)

- Principal discussion on the definition of ductile behaviour.
- Representation and characterisation of load slip characteristics.
- Ductility requirements in guidelines.
- Case studies related to the above mentioned topics.

Today and Tomorrow

- The sessions:

Robustness of Timber Structures (coordinated by John D. Sorensen)

- Review collapses with respect to robustness
- Benchmark examples
- Guideline

Today and Tomorrow

- The subordinate goal of the sessions:
 - General discussion on the identified topics
 - Definition of tasks and work packages
 - Designation of task groups
 - Identification of further procedure and working mode

Perspectives and Outlook

- Establishing lively working and communicating task groups working jointly and publishing their findings:
 - In form of scientific papers
 - Reports and guidelines
- Using the STSM tool !!!
- Organising working meetings but also workshops with scientific presentations
- Organising the final conference
- Details for the strategic planning to be discussed in the MC meeting – with the additional insight of this workshop.

Perspectives and Outlook

- Cooperation with COST Action TU0601 'Robustness of Structures' on a legal basis and financially supported by the COST administration.
 - ✓ First meeting joint meeting is planned in September in Lubijana.
- New activity on „Assessment of existing timber structures“
- Special session on COST E55 on www.icsa2010.com July 2010.
- Representation on WCTE 2010
- Final Conference Spring 2011

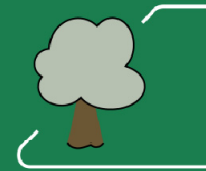
Perspectives and Outlook

- New activity on „Assessment of existing timber structures“

I wish you a successful
meeting



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