

2010

2015

2020

2025

2030

Forest-Based Sector
Technology Platform



The Forest-based Technology Platform: synergies between ETPs on construction related research priorities

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ECOLOGICAL ADVANTAGES OF WOOD

- ▶ **Wood is a renewable material (sustainable forestry management)**
- ▶ **Forest and wood products are carbon sinks**
- ▶ **Wood products are low energy cost materials**
- ▶ **At the end of life of products, wood is an easily recyclable material, and a possible energy source**



Synergies between ETPs

- ▶ **Novel building concepts**
- ▶ **Low resource and energy consumption buildings**
- ▶ **Novel wood-based materials and environmentally friendly biomaterials**
- ▶ **Pre and co-normative research**
- ▶ **Indoor air quality, eco-conception, recycling**
- ▶ **Modeling**



Innovative building concepts

- ▶ **Multi-material solutions to improve properties in terms of strength, shape stability, durability, human comfort and perception, sustainability : association of wood-based and non wood materials**
- ▶ **Solutions with improved combined acoustical and thermal performances**
- ▶ **Design of walls using hydrothermal and inertia behaviour: breathing walls, integration of phase changing materials (PCM)**
- ▶ **Integration of small heating/cooling elements in buildings, parieto-dynamic systems, solar device integrated in joinery**
- ▶ **Development of system solutions in building providing high flexibility with respect to the evolution of society (ageing inhabitants, growing-up children)**



Low resource and energy consumption buildings

- ▶ High energy efficient buildings, a large part are timber and fiber based constructions. Create innovative construction systems for new and renovation of existing building
- ▶ Well suited detailed junctions of all components
- ▶ Environment assessment : to minimise the potential environment impact of the new materials
- ▶ CO₂ storage → management and treatment of wastes (energy)



Novel wood-based materials and environmentally friendly biomaterials

- ▶ Nanostructured composite materials with tailored properties : prevention of environmental pressures including risks on health
- ▶ Novel materials for extreme conditions and environments
- ▶ Learning from nature regarding surface properties (lotus effects, water repellence, self cleaning, durability (environmentally friendly preservatives) and mechanical behaviour)
- ▶ Understanding of fundamental chemical interactions : knowledge in materials and chemical processes at the nano-scale, relationships among structure and properties
- ▶ Creation of new materials through using multiple, natural renewable or non-renewable resources which reduce wastes

Pre and co-normative research

- ▶ **New construction methods in conflict with standards and national building codes ?**
- ▶ **Criteria catalogue for quality assurance for wooden based passive houses in order to avoid technical barriers**
 - **good thermal insulation, junction details without thermal bridges, air tightness, optimized ventilation system**
- ▶ **Valorization of novel building concepts**



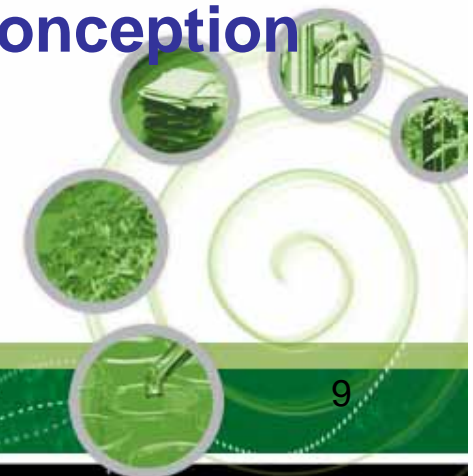
Indoor air quality, eco-conception, recycling

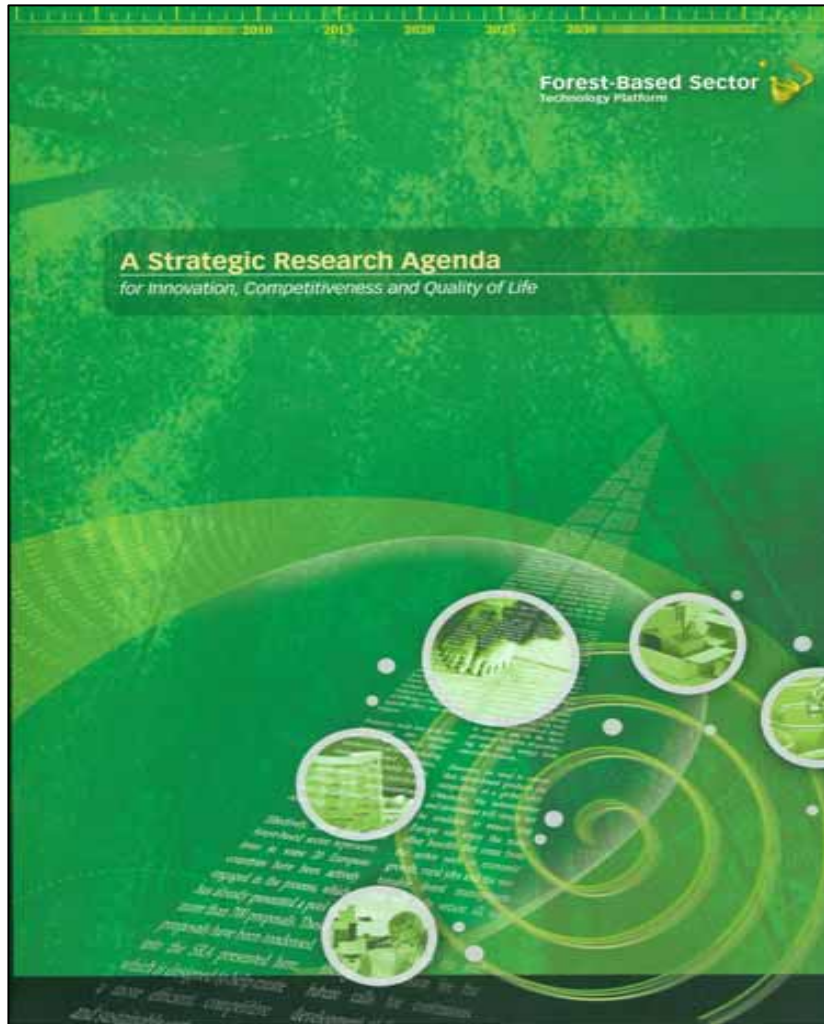
- ▶ To understand how indoor air pollution is affecting the health of citizens
- ▶ To develop biomarkers for indoor pollutants
- ▶ Innovative technologies in eco-conception to reduce waste production
- ▶ Green glues
- ▶ Sanitary and environmental assessment (materials)
- ▶ Clarification of the role of wood in improving indoor climate and reducing the « sick building syndrome »



Modelling

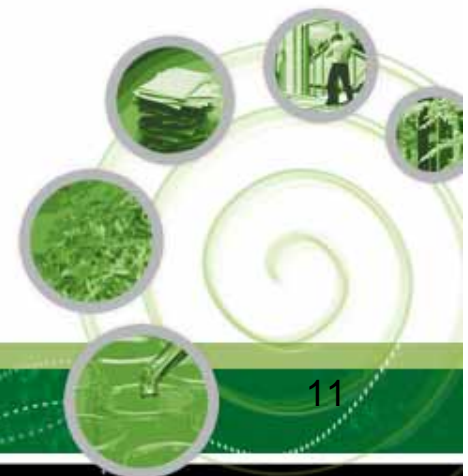
- ▶ Prediction and characterization methods for sound transmission for lightweight buildings
- ▶ New building constructions solutions will be implemented on full scale experiment, using thermal simulation, noise reduction, fire protection
- ▶ Material performance : modelling of microstructural mechanical evolution under work conditions
- ▶ Development of model and prediction tools for indoor air exposures related to buildings conception





As a conclusion

- ▶ Owing to its advantages (energy and environment) wood will offer a lot of smart applications in the building sector
- ▶ Let us look at it more closely !





Thank you for listening!

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