COST FP 1303 meeting

WG1 : Material capability and enhancement

Day 2, 28th January 2013

Short Overview of Strategic Actions on going in France contributing to the development of bio-based building materials

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Discussed Topics

- Standardisation of bio-based materials, Regulations and Related research actions
- Strategic actions driven by « DHUP » (Ministry of Ecology and Sustainable Development / Branch development of housing and nature / Habitat management, urban planning and landscape)
- Research on going
- Networking

Standardisation of bio-based materials and Related research actions

- **CEN TC 411 Bio-based products (FCBA actions)**
  - **WG1 Terminology**
  - **WG2 Bio-solvent**
  - **WG3 Bio-based content**
  - **WG4 Sustainability criteria, LCA**
  - **WG5 Certification and declaration tools**

The task of WG3 : Development of methods for the determination of the bio-based content of solid, liquid and gaseous products.

- **by existing radiocarbon content standards, ^{14}C and elemental analysis**
- **by the measurements of stable isotopic elements ^{13}C, ^{15}N, ^{18}O and ratio $^{13}C/^{12}C$ …**
- by a method to identify **raw material flux analysis** (input and output generation of biobased products)

Related research actions / Standardisation

- **Project on going : FCBA/ISA CNRS, Department of the Institute for Analytical Sciences (2013-2014) – <u>for Panel industry</u>**

Development of technique for determining the bio-based content
- Analysis of stable isotopes $^{13}C/^{12}C$, $^{18}O/^{16}O$, $^{15}N/^{14}N$

- Applied method for analysis of oil, product (to control the exact origin), applied to determine the geographic origin of a product
  - Quick and inexpensive (reducing price by factor 5)
  - Complementary or alternative method for determining the bio-based content by measuring the ^{14}C

Two ways :
- Development of an alternative or complementary technique to the analysis by ^{14}C (method to be validated on commodity boards, panels, ...)
- Material flow analysis (application process)

Strategic actions driven by « DHUP »*

- **Action plan 2011-2013** : 24 actions
- Objectives :
  - **Facilitate the use of biobased materials for building construction (according “bio-based building label (DHUP)”; 3 label levels according level of “biomass” expressed in kg/m²**
  - **Removing regulatory and normative , brakes; facilitate recognition**
  - **Structuring the sector bio-based materials (hemp, flax, straw, ...)**

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Strategic actions driven by « DHUP »*

– Action plan 2011-2013 : 24 actions

Deliverables :

- Report on **Identification of normative and regulatory barriers to the prescription of bio-based materials in construction** (FCBA, 2012) :
  http://www.fcba.fr/sites/default/files/fcbainfo_17_2013_jlamoulie__article_biosources.pdf

- Report of C&B (Construction and Bioresources) and DHUP :

Markets of bio-based materials and régional actions

- http://www.constructions-bioressources.org/wp-content/uploads/2013/06/20130612-Congr%C3%A8s-CB-pr%C3%A9sentation-NOMADEIS-Lecture-seule.pdf

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Strategic actions driven by « DHUP »

- **Identification of normative and regulatory barriers to the prescription of bio-based materials in construction**
- **Objectives :**
  - An inventory of obstacles records and actions to be undertaken, **Analysis focused on the normative and regulatory brakes Goal: finely analyze the current normative and regulatory constraints and assess opportunities in response generic recognition (common to all of the bio-based industry), in an appropriate multi-criteria approach**
  - Information and reliability of 3 types of technical information are:
    - performance of products (materials, components, systems)
    - design of structures (justification requirements and thresholds)
    - implementation of products in structure (eg DTU)

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Strategic actions driven by « DHUP »

- **Materials :** Cellulose wadding in bulk for filling cavities of walls, floors and roofs ; Aggregates and plant fibers in bulk for filling cavities of walls, floors and roofs ; Non-structural concrete plant & inner and outer lining of vertical walls ; Mortars for plants indoor and outdoor insulation coating
- **Delivrables : Identification of actions in order to avoid regulatory brakes ; scientific informations to be collected to recognize the products by users**
  - Product performance (Thermal Conductivity, Dimensional stability and mechanical behavior, Behaviour and water permeability, Reaction to fire)
  - Design works from the product (Thermal compatibility regulatory compatibility acoustic regulations, fire regulations Compatibility, Safety walls)
  - Correct Implementation of product
- **Partners : Construction & Bioressources, Réseau Français de la Construction en Paille, CETE de Lyon, IFSTTAR, CODEM Picardie, Construire en chanvre, ECIMA, DHUP et FCBA.**

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Strategic actions driven by « DHUP »

Class Uses and Durability of insulation Bio-sourced materials againts Molds (2011-2014)

- **Objective :** Facilitate the access of bio-based insulation market and particularly the Technical Assessment
  - **Optimization of sustainability criteria for bio-based insulation against mold according to the intended use**. The aim is to develop a test method criteria standardized to determine the risk of mold growth in the literature, and different employment insulation classes.

- Standardization: Evaluation of the resistance of bio-based insulation methods against the mold. **The purpose is to promote standards that can be part of the evaluation procedures such as Avis Technique**.

- Partners : FCBA, CSTB, producers of insulation materials

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Research on going (examples)

– Bio-based glues, Panels and composites

- Uses of **tannins** and **lignins** (by products from industry), **new panel concept** :
  - BEMA : FCBA, ROLKEM, DARBO SONAE, EGGER, IPREM, UPPA, LCPO, LERMAB, ARKEMA, CANBIO
  - NEOLIGNOCOLLE : FCBA, RESCOLL, ROLKEM, LCPO, UIPP, SERIPANNEAUX …
- **Bio-based Acrylic** glue ; **Plywood**
  - COLACRY : FCBA, LERMAB, GARNICA PLYWOOD, ARKEMA, COATEX

Research on going (examples)

– Extractives et biocide efficiency

- Exploitation of bio-active substances and extractable wood residues / industrial co-products from wood pulp: Development of a new path for waste recovery
- Georgia Pacific France, Smurfit Kappa Cellulose du Pin - Usine de facture, Tembec R&D Tartas, Tembec R&D Kraft, GESVAB, ENSIACET-LCA, CTP, FCBA

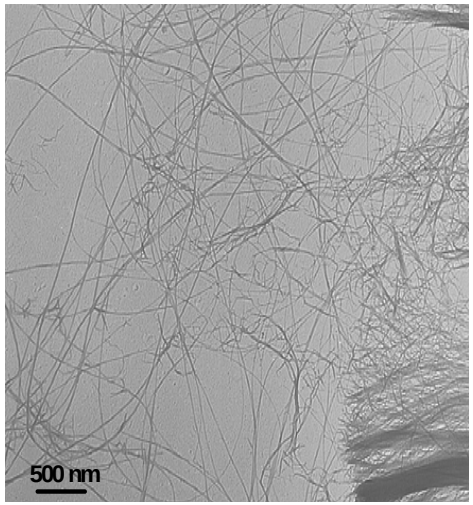
– Bio-based polymers

- Polyols and wood components valorisation
- LCPO, FCBA, ITERG

Research on going

– Coating products ; MFC reinforcement

- Uses of biobased content and increase product performance ; Uses of MFC (Cellulose microfibrils) reinforcements in finishing products for flooring applications
  - FCBA, TECNALIA



Networking

- **National driving forces**
  - Roadmap from government
    - Green chemistry, chemistry and composites, wood in construction, bio-based substitution (from biomass) of fossil products
- **Regional roadmap and actions**
  - Green chemistry (uses of wood extractives, valorsiation of by-products from paper industries, bioplastics, insulation products made with green additives, bioraffineries, …)
  - New materials for building construction (WPC, bio-based products, …)
- **Cluster with SME/Companies** involved in wood sector but also on differents sectors (plastic, textile, Aeronautic, …)

Thank for your attention

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