Session 7	Scale-up of novel biomaterials and processes, powered by INN-PRESSME
Pitch Title	Development of an UV-curable, biodegradable coating for wood products
Company	Kayalar Kimya & Fraunhofer Institute for Silicate research
Speaker	Dr. Ebru ERGUVEN, Dr. Ferdinand Somorowsky
Keywords feedstock	Cellulose
Keywords technology	Wood coating, protective coating, improved surface properties, sol-gel-chemistry, UV-curing, biobased materials
Keywords End-Product	Furniture paints, wood coating, Improved mechanical and chemical properties, long time stability, partially biobased material

Abstract:

The project was conducted by a consortium that included Kayalar Kimya, a leading manufacturer of wood coatings, as the industrial partner; the Fraunhofer ISC, a development institute specializing in functional layers; IWNRZ, experts in biobased fiber technology; and IRES, responsible for environmental assessments.

The goal of the project was to develop a bio-based, hybrid coating material using sol-gel chemistry to protect wood surfaces. The challenge was to create a new material that fulfills all requirements for mechanical resistance, chemical stability, appearance, and biodegradability.

By incorporating microfibers made from flax or hemp, the project aimed to integrate additional antimicrobial and flame-retardant properties. The hybrid polymers were evaluated not only as the protective top layer but also as binders for existing products to enhance biodegradability via breaking point while improving mechanical properties.

After identifying the most suitable formulation, it was optimized for adhesion, scratch resistance, abrasion resistance, insensitivity to coffee and alcohol, and overall appearance. Commercial and specially manufactured liquid and solid additives were utilized for this purpose. The optimized formulation was then scaled up and applied to large wooden panels using a roller application technique.

The project was accompanied by a Life Cycle Assessment (LCA) study that compared the current state of the materials with the new developments based on sol-gel modified paints.