WoodWisdom-Net

MouldPulp

Development of Durable, Fully Bio-Based Thermoplastic Composites from Bioplastics and Pulp Fibres for Injection Moulding Applications

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Project Objectives and Main Tasks

Background

- Promising wood-polymer concept DuraPulp® from cellulose pulp and PLA
- Fully renewable
- Good mechanical properties
- Perceived naturalness and nice tactile properties
- Dyeing with clear colours possible

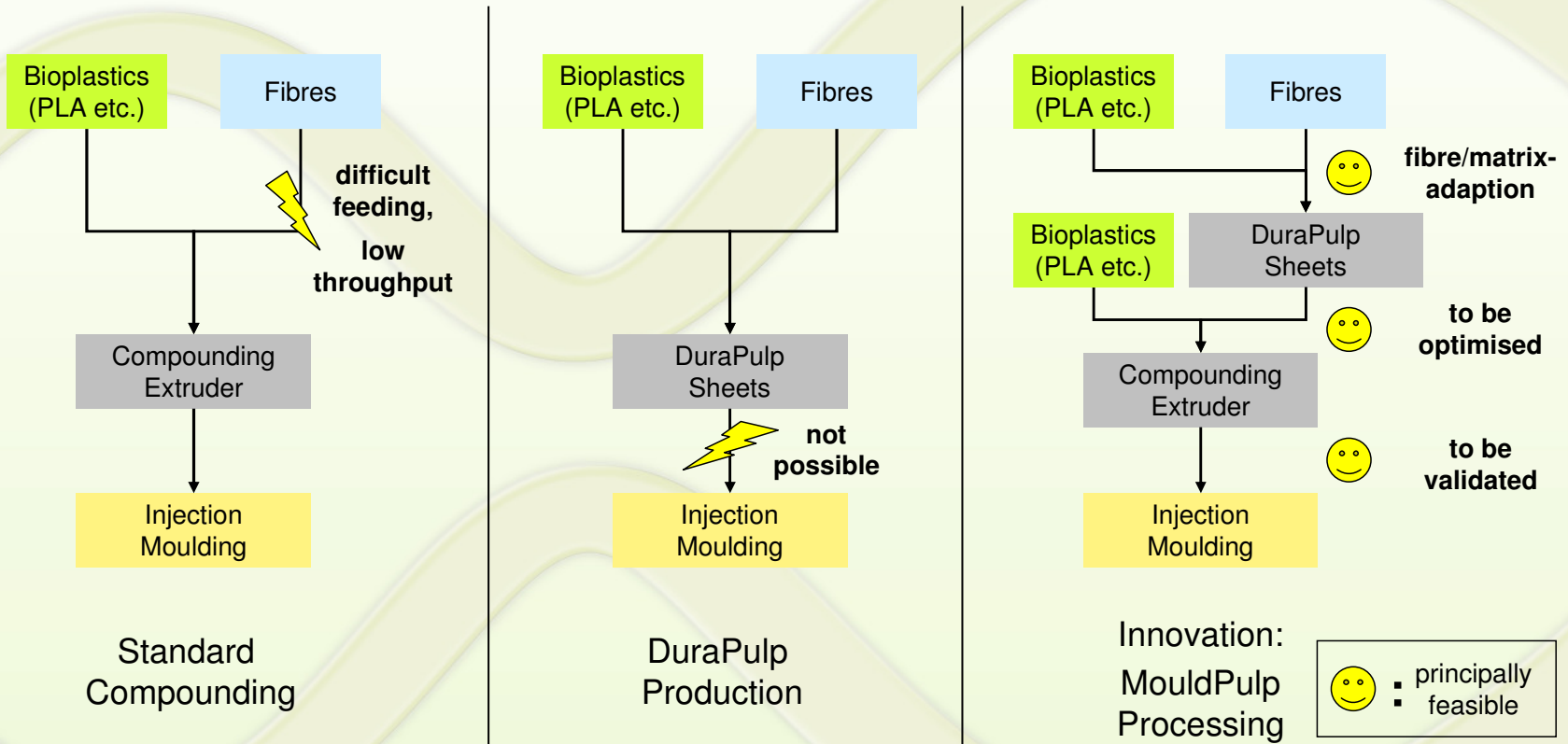
Problem

- Lack of viable industrially production methods to make end consumer products

Objective

- **Development of a processing technology that allows to make injection moulded parts out of DuraPulp® but keeping the material identity**

Project Objectives and Main Tasks



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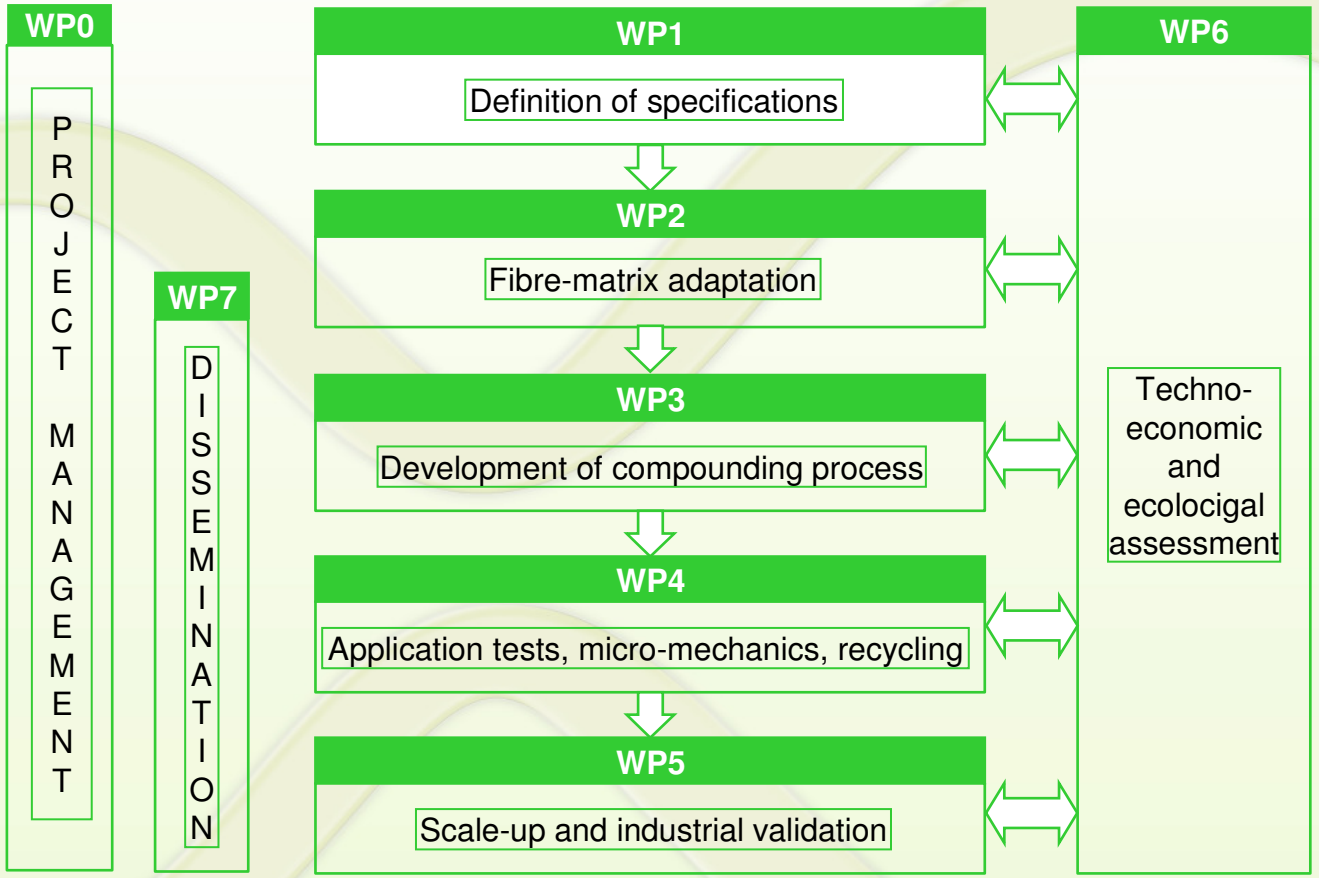

Project Objectives and Main Tasks

- **Fibre-matrix adaption (WP2)**
  - Fibre selection and pre-treatment
  - Polymer selection and blending
  - Dyeing of fibres and matrix

- **Development of compounding process (WP3)**
  - Milling and compacting of DuraPulp® sheets
  - Material formulation
  - Dosing and feeding equipment
  - Gentle compounding process
  - Homogenous fibre dispersion

Project Objectives and Main Tasks

- **Application tests (WP4)**
  - Injection moulding try-outs
  - Material characterization and evaluation of moulded parts
  - Development of recycling system

- **Scale-up and industrial validation (WP5)**
  - Scale-up of compounding process
  - Injection moulding try-outs
  - Evaluation of moulded parts

- **Techno-economic and ecological assessment (WP6)**

Project Partners and their Roles

Project team along the whole value chain

R&D Assessment Materials Manufacturing Market

Fraunhofer UMSICHT
(Germany)
Material development bioplastics

Innventia AB
(Sweden)
Material development pulp
Developer of DuraPulp

Södra
(Sweden)
Raw materials &
product development

Hammarplast Consumer AB
(Sweden)
Consumer plastics products

FKuR Kunststoff GmbH
(Germany)
Compounding company for bioplastics

nova-Institut GmbH
(Germany)
Techno-economic and
ecological assessment

Elastopoli Oy
(Finland)
Application development

Expected Impact and Target Groups

- **Novel natural fibre reinforced composite DuraPulp®**
  - 100% bio-based composite (PLA & pulp)
  - Injection moulding
- **Significantly increasing of using natural fibre reinforced biopolymers**
- **Open up the market of consumer products**
  - High efficient processing technology (IM)
  - Durable, high-quality products
  - light-weight, naturally impression, dyeable
  - good eco-balance

Expected Impact and Target Groups

- **Innovative bio-based consumer products for a worldwide market made in Europe**
  - Use of cellulose pulp strengths the forest-based value chain
  - Novel and modified processing technology creates new opportunities for machine manufacturers
  - Novel design concepts for consumer products
  - Generation of manufacturing capacities

- **In accordance to the European Lead Market Initiative focused on bio-based products**

Added Value from Transnational Approach

Multidisciplinary and international approach is required to reach the project goals:

- Preparation of functionalized fibres (Innventia, Södra)
- Development of bioplastics (Fraunhofer UMSICHT)
- Plastics processing (FKuR, Hammarplast, Elastopoli)
- Techno-economic and environmental assessment (nova, Innventia)

Trans-European approach due to long-termed regional knowledge build-up:

- Sweden: wood and pulp processing
- Germany: bioplastics production and promotion
- Finland: fibre reinforced plastics

In addition the transnational approach will help to disseminate the project results and to transfer the technology into the industry.

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Thank you for your attention.