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it's all about innovation





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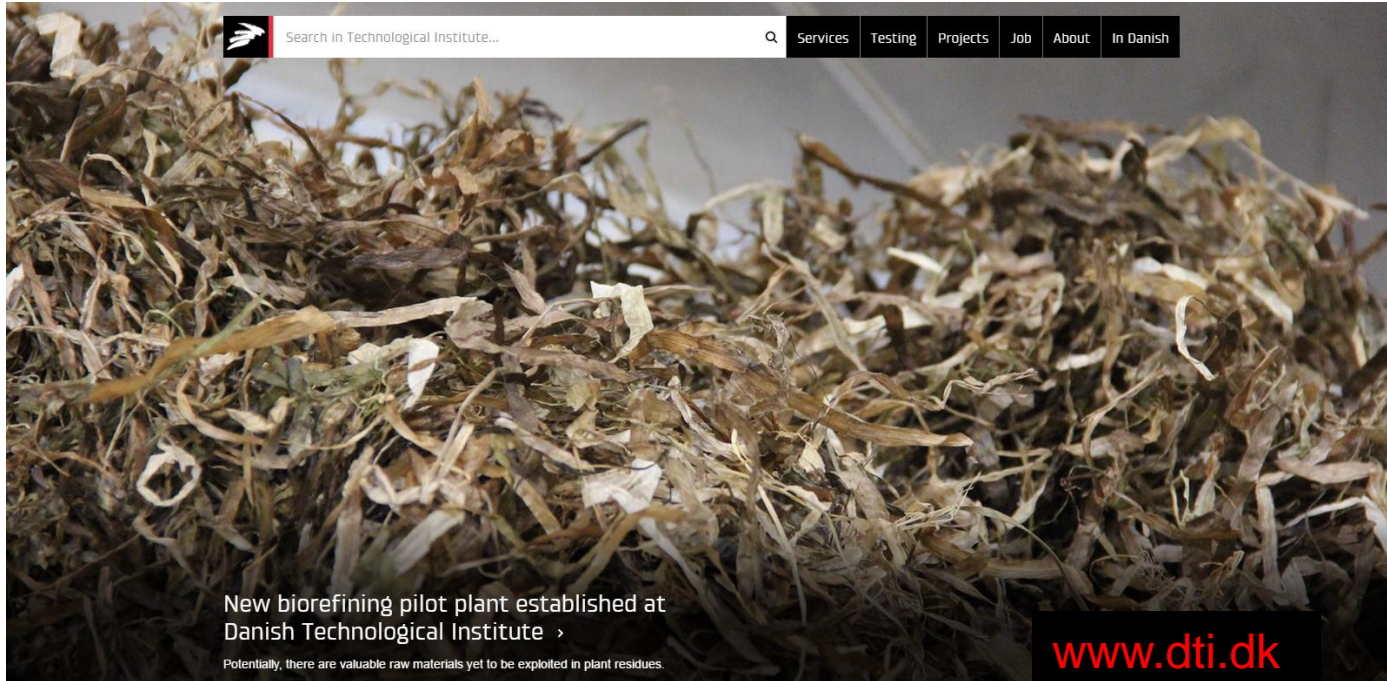
Forståelse af LCA ved udvikling af nye biobaserede produkter

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DTI is a leading Danish research and technology institute



- Objective: to address industrial sector and society needs through the development and dissemination of technological innovation

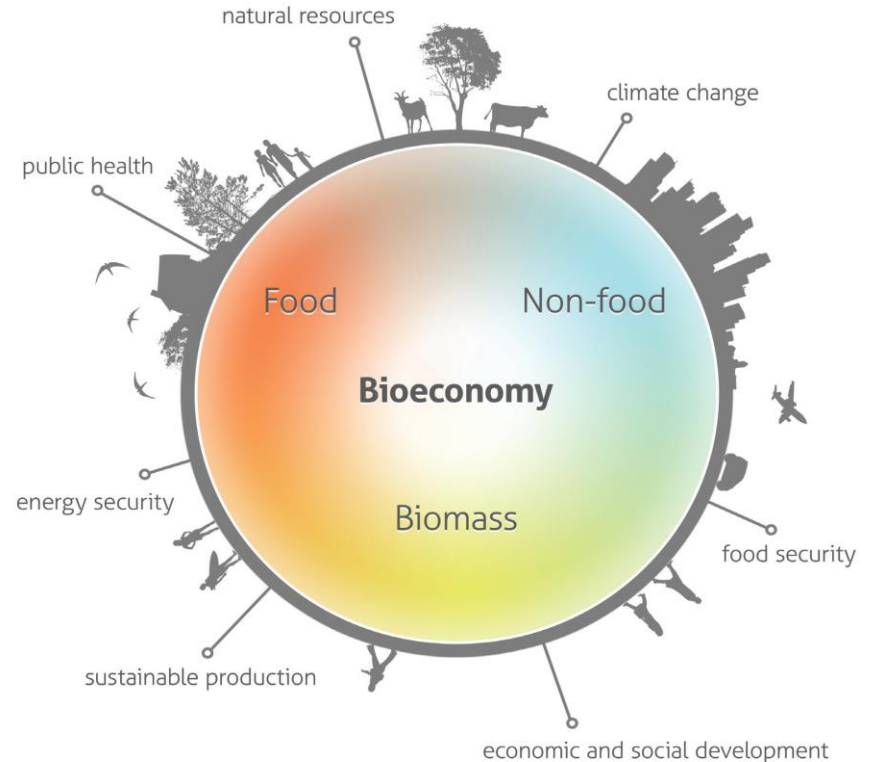


Circular resource economy



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- Sustainable production
- Optimal use of resources
- Reuse of materials
- Design for disassembly
- Reduced use of fossil based materials





Center for Wood and Biobased Materials

Furniture, toys and textiles

Emissionslab

Surface treatment, coatings and microbial degradation

Identification of mould and bacteria

Pilotscala biorefining: Upcycling of rest materials

Biocomposits

Biobased processes, development and products to substitute fossil based compounds

Biorefining in pilot scale

The Biobased Business



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Biomass ↔ Development of new technologies and processed ↔ Products



Impact:

Business models for the biomass value chains



Development of sustainable composite materials

Boards (MDF, OSB, PB)

- Building materials
- Furniture / interior design
- Industrial products

Insulation mats

Binders, bioplastics and glues

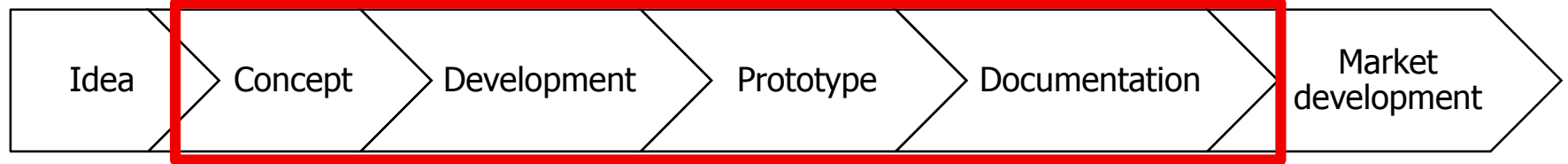
Biobased paints / coatings



From Bio to Business



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Value-added processing of biomass

- Through enzymatic hydrolysis

Objective



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- Create a hub for companies and projects to develop and test their ideas for “**value-added products**”
- A **pilot scale facility** can validate economical viability of the bio-refining processes of biomasses
- Generate sample material for product test, animal feed trials and initial product development





Added-value biorefining

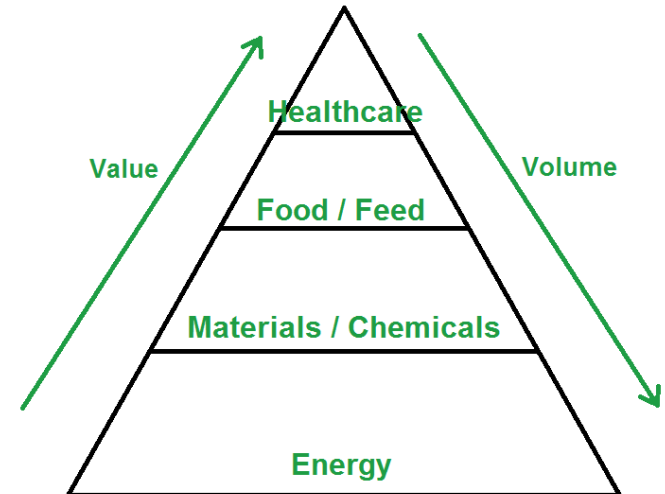
- Cascading utilisation of Biomass

Extraction of multiple valuable components from a single source



Proteins

Fibres
Hemicellulose
Lignin
Lipids
Waxes
Antioxidants
...



Bindersystemer anvendt i spånplader, MDF og OSB i *Europa*



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Most frequent

- UF: Urea-formaldehyde (spånplader, MDF)
- MUF: Melamine-urea-formaldehyde (spånplader, MDF, OSB)
- PF: Phenol-formaldehyde (OSB)
- PMDI: Polymeric methylene di-isocyanate (spånplader, OSB – Majority)

Changes due to ...



- Formaldehyde emission
 - Limit:
 - 8 mg/100 g board (E1 class) in Europe
 - 2-4 mg/100 g board CARB (California Air Resources Board)
- Carcinogenic substances
- Petro-chemically derived

Biobased binders



- Still insignificant importance
- Demand for NAF: no-added-formaldehyde wood panels
- Much research on bio-adhesives
 - Tannin-based
 - Lignin-based
 - Soy-based
 - Proteins
 - Expensive

Challenges



- Properties
 - Moisture-resistant
 - Fire-resistant
 - Insulation properties
 - Anti-microbial
 - LCA

LCA: Protein vs. Formaldehyde based glue



3	LCA 1			
5	Production of soya-based proteins in South America	vs.	Production of locally based protein	Functional unit Production of 1 kg _{PROTEIN} in concentrated form (≈60% protein content, i.e. ≈1,6 kg _{POWDER}) for use as animal feed available in Denmark
6				
7				
9				
10				
12	LCA 2			
14	Production of Formaldehyde-based glue	vs.	Production of soya protein-based glue	Functional unit Production of 1 kg glue for XX use with YY performances
15			Production of locally-based protein	

Biobased adhesives



- Dangers related to LCA interpretation
- Good or bad in terms of LCA ??

Mange tak for jeres opmærksomhed

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A photograph of a brick wall with a large, illuminated sign. The sign consists of two lines of text: 'TEKNOLOGISK' in black letters and 'INSTITUT' in red letters. The letters are backlit, creating a warm glow. The background is a close-up of a red brick wall with white mortar.

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