



Horizon2020 Information Days on Public-Private Partnerships

Brokerage event
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FURAN BASED BINDERS AND APPLICATIONS THROUGH SMART AND INTEGRATED USE OF BIOMASS

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SP Technical Research Institute of Sweden

Largest research institute in Sweden

-1333 employees/ Revenue approx. 146 Millions € (2013)

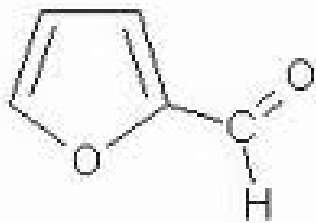
- Fully owned by RISE (Research Institutes of Sweden)

- 18 technical units and subsidiaries/ represented by 6 business area units*
- 14 competence platforms and 10 cross-disciplinary co-operation projects*
- **Co-operation project Bioeconomy***
 - SP Wood Technology*
 - SP Energy Technology*
 - SP Chemistry, Materials and Surfaces*
 - SP Process Development*
 - SP Processum*
 - JTI Swedish Institute of Agricultural and Environmental Engineering*
 - SIK Swedish Institute for Food and Biotechnology.*

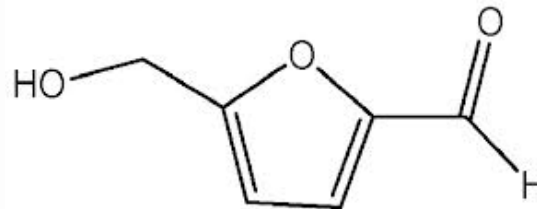
Furan based binders and applications through smart and integrated use of biomass

What's furans?

- Chemical 5 membered heterocyclic ring structure with aromatic properties
- Conversion products from hydrolyzed cellulose/hemicellulose
- Formed predominantly by harsh/ acid catalyzed hydrothermal treatment of feedstock
- Two typical furan chemical blocks at focus; Furfural and Hydroxymethylfurfural (HMF)
- Recognized as potential green substitutes in green chemicals, materials and fuels



Furfural



Hydroxymethylfurfural

Furan based binders and applications through smart and integrated use of biomass

Project concept

- *Furans from agro and forest biomass and pulp mill side-streams*
- *Smart and integrated extraction and conversion to furan chemical building blocks*
- *Synthesis and pilot scale testing of binders, adhesives and other applications from furans*

“Continuation” of project BioCoilCoat under the umbrella project Furu2furan

Adressed SPIRE Roadmap – Process: Solutions for more efficient processing and energy systems for the process industry, including industrial symbiosis (e.g. cross-sectorial application of technologies).(KA 2.5: New energy and resource management concepts) (including industrial symbiosis)/

Adressed Call:

SPIRE 6: Energy and resource management systems for improved efficiency in the process industries

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Features of project idea

- *Cross-sectorial (Forest/Agro/Chemical/Coatings/Biomaterials /Metals and Steel/Process technology)*
- *Complete value chains represented, e.g. (biomass to green coatings, adhesives, fuels and materials)*
- *Cross-disciplinary (Chemical/physical/LCA/techno-economy/process techn./ biomass techn./steel techn.)*
- *Increase the TRL to validate value chains by means of techno-economy, system and market evaluations*
- *Smart and integrated design of multiple process lines for maximum total yield and profit*

Furan based binders and applications through smart and integrated use of biomass

Based on earlier successes; examples

Furu2furan (12 companies/ SP&KTH)

A VINNOVA project. Ended 31st of July.

Demonstrated extraction of chemical compounds (furans, sugars, acids) from biomass at demo-scale (TRL 6).

Use of filtration and ultra-filtration in pilot scale to fractionate /separate compounds (TRL 4-5).
Lab scale conversion to intermediate furan compounds (TRL 2-3).

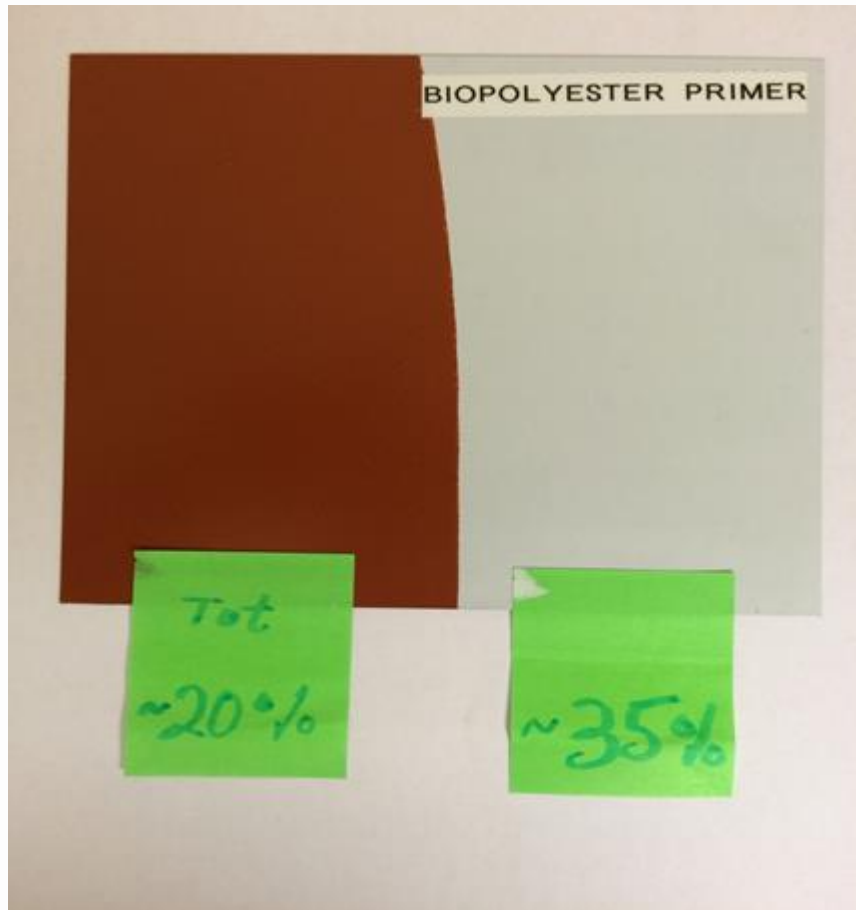
BioCoilCoat (3 companies/ SP&KTH)

A VINNOVA project that brings green carbons to coated steel. Ends 30th of November

The cross disciplinary projects has shown in pilot scale (TRL 4-5) that polyesters based on renewable furan chemical building blocks in coil coatings for can increase the content of green carbons significantly (35%)..

Furan based binders and applications through smart and integrated use of biomass

Based on earlier successes; examples



BioCoilCoated aluminium.

Totally appr. 20% green carbons (primer + top) and appr 35% green carbons in primer.
AkzoNobel Industrial Finishes AB, Gamleby. White primer based on biopolyester (FDCA) and a red top coating (half plate) with a red standard product (Prelaq Greencoat SSAB) containing a biobased diluent (RME appr. 10%).

EXPECTED IMPACT

- *Increased use of renewable furans as a resource for substitution in fossil based coatings, chemicals, fuels and materials*
- *Validation of whole value chains at TRL ≥ 5*
- *Optimization of energy and resources by means of system analysis and market feasibility studies.*
- *Development of new consortia by integrating cross-sectorial industries*

EXISTING PROJECT CONSORTIUM



ROYAL INSTITUTE OF TECHNOLOGY

HOLMEN

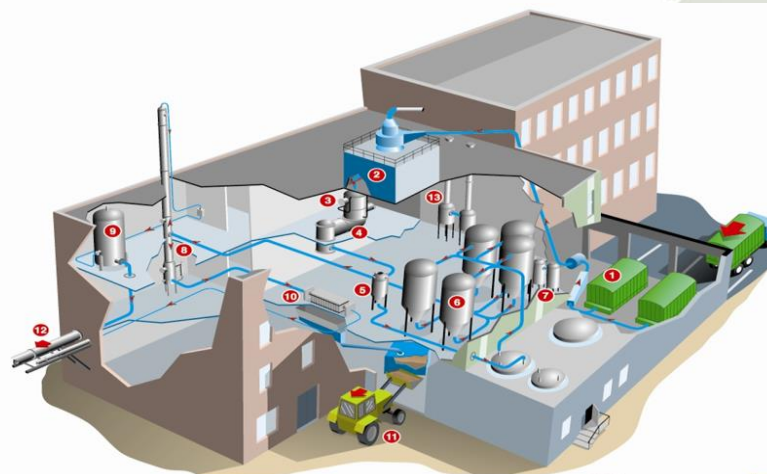


Lantmännen



KIRAM

SVEASKOG



Energimyndigheten



TransFurans Chemicals BVBA

BIOMASS BASED CHEMICALS



SP Biorefinery Demo Plant, Örnsköldsvik, Sweden



LOOKING FOR PARTNERS

- *To present and develop utilization of furan based binders and applications*
- *To form strong value chains from raw material to end products (e.g. metal coatings)*
- *To demonstrate and validate process lines and value chains (TRL \geq 5)*
- *To contribute and strengthen the competences of consortium*

Companies

Coatings, binders
and adhesives

[SME:s]

Chemicals and
additives

Energy and
Fuels

Biomaterials and
composites

CONTACT DETAILS



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