

Towards green transition in EU regions: case study East and North Finland

Tuesday 26th April 2022 Rovaniemi/ hybrid-event

Santa's Hotel Santa Claus in Rovaniemi

Korkalonkatu 29, 96200 Rovaniemi

8:30 - 9:00 Coffee

9:00 – 12:00 **S3 high impact projects in Green Transition**

Case **S3 Mining Industry**, Ilkka Nykänen, Business Joensuu, North Karelia

Cases in **Digital Industry Solutions and Lignin Processing**, Jarkko Rätty, MITY, Kainuu

Case **Hydrogen transition by fossil-free steelmaking and steel applications**, Professor Jukka

Kömi, University of Oulu, Northern Ostrobothnia

12:00 – 13:00 Lunch

13:00 – 16:00 **S3 high impact projects in Green Transition** (including a coffee break)

Case **Oulu Innovation Alliance**, Specialist, City Coordinator Maria Vuorensola, BusinessOulu, Northern Ostrobothnia

Case **Biovalley Finland**, Jouni Kaipainen (yliopistokeskus) Central Ostrobothnia (päätös ennen klo 15.00)

Case **Green Transition Committee of Lapland**, Hanna-Leena Pesonen, Regional Council of Lapland, Region of Lapland

Wednesday 27th April 2022 Rovaniemi/ hybrid-event

Science Centre Pilke, Ounasjoentie 6, 96200 Rovaniemi

8:30 - 9:00 Coffee

9:00 – 11:00 **S3 high impact projects in Green Transition**

Case **Kuopio Water Cluster**, Eero Antikainen, Pohjois-Savo

Case **EcoSairila Mikkeli**, Panu Jouhkimo, South Savo

11:00 – 12:00 Lunch

12:00 – 16:00 **Other relevant Actors and Ecosystems in East and North Finland:**

12.00–12.30 **Kemi Ecosystems.**

Head of Economic Growth and Development Mervi Nikander, City of Kemi

12.30–13.15 **Relevance and Future Aspects of Forestry in East and North Finland,**

Regional Mayor of Kainuu, Pentti Malinen

13.15 – 14.00 **Photonics Finland**, Cluster Manager Juha Purmonen

14.00 – 14.30 Coffee Break

14.30 – 15.15 **Green Hub in North Karelia,**

University of Eastern Finland, Professor Jouni Pykäläinen

15.15 – 16.00 **Innovation Platform Noheva in Savonlinna,**

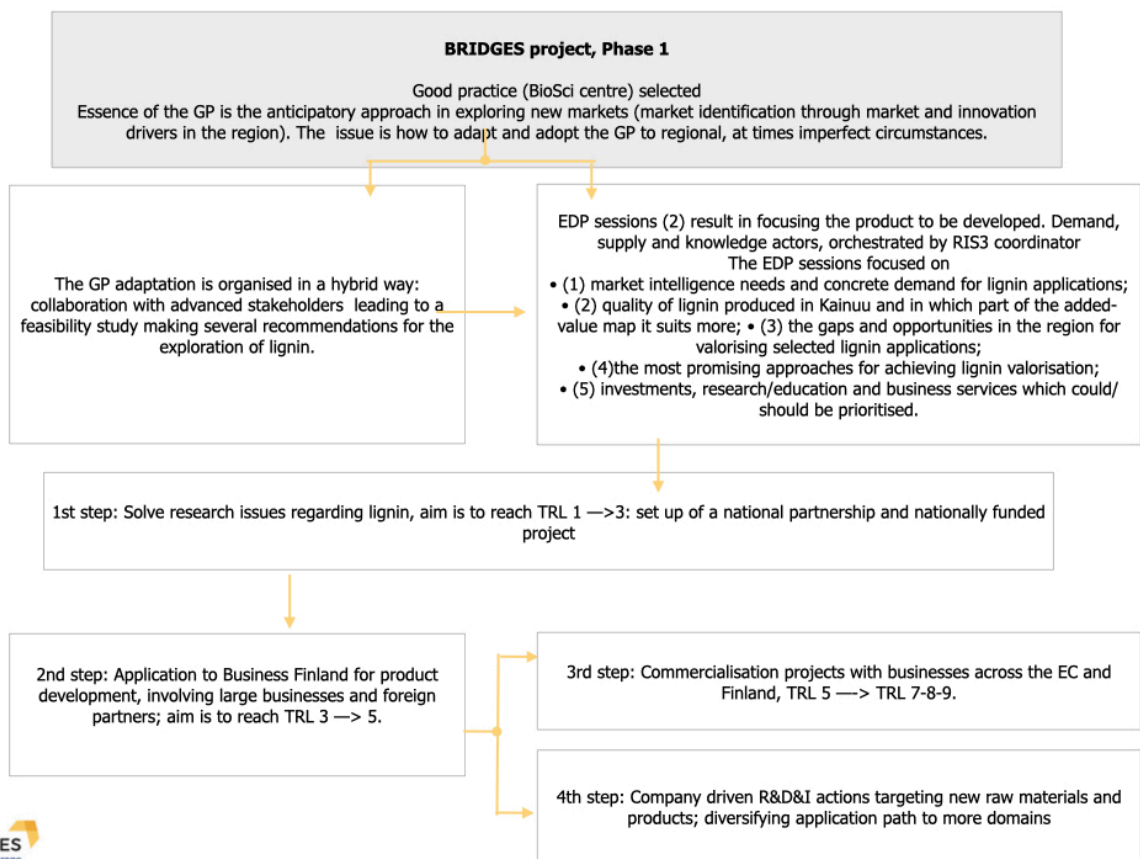
Sami Sopanen (City of Savonlinna), Lasse Pulkkinen (South-East Finland University of Applied Sciences) and Petteri Vanninen (Luke)



Thursday 28th April 2022 Rovaniemi

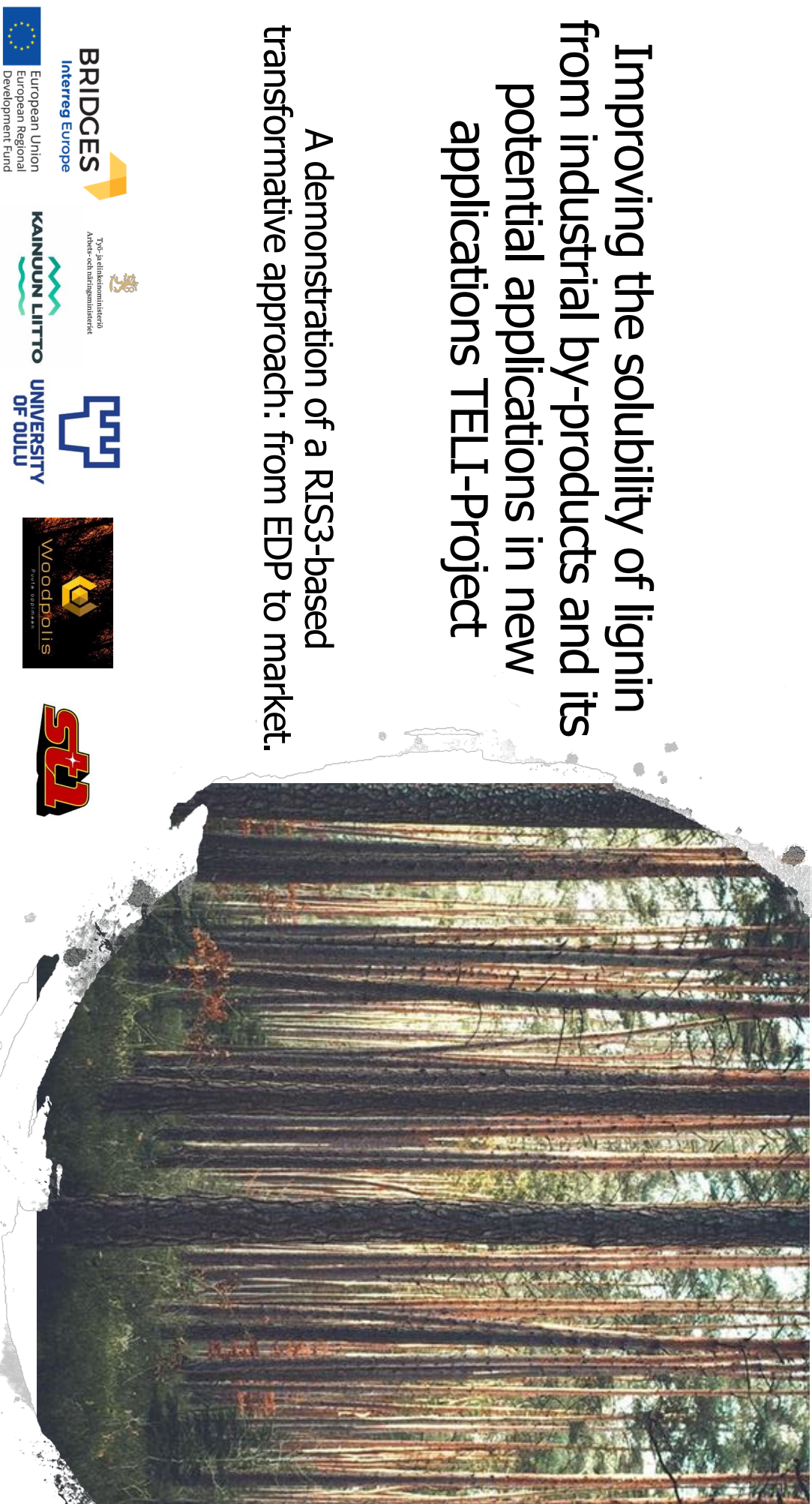
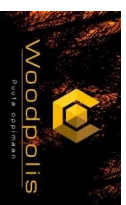
Science Centre Pilke, Ounasjoentie 6, 96200 Rovaniemi

- 8:30 - 9:00 **Coffee**
- 9:00 - 11:00 **Discussion on innovation-led green transition future Regional Council representatives of East and North Finland**
Monitoring results in Green Transition and S3, Regional Council of Lapland
Discussion led by the experts
- 11.00 - 12.00 **Meeting with public funding bodies in East and North Finland**
Development Directors of Regional Councils in East and North Finland
Centre for Economic Development, Transport and the Environment (Rovaniemi), Business Analyst Hanna Hietajärvi
- 12:00 - 13:00 **Lunch**
- 13:00 - 15:30 **High Impact Action HIA-Projects 2019–2020**
Introduction of the results of the pilots
A site visit to one of the pilot project partners: Lapland University of Applied Sciences, Petri Kuisma



Improving the solubility of lignin from industrial by-products and its potential applications in new applications TELI-Project

A demonstration of a RIS3-based
transformative approach: from EDP to market.

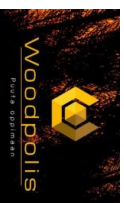


TELI project, a project-based RIS3 transformative change demonstrator and a probable good practice?

Why do we claim this? TELI project is at the same time, developing a new market based on the base of an innovative approach.

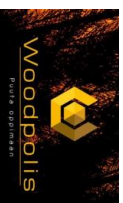
The approach adopted a systematic, transferable approach integrating research, business, market and constant feedback inputs:

- > a feasibility study first confirmed the relevance of lignin exploration for new products; —> two EDP sessions —> team of research, production, testing (baseline new market), —> and then full scale commercialisation with measures to attract businesses in Kainuu to co-locate production with processing of side stream have been foreseen.



Background of the TELI project (1)

- TELI project implements Action 1 of the Kainuu Action plan, a result of Phase 1 of the Interreg EUROPE BRIDGES project. The Kainuu action plan was approved by Interreg Europe [IE] on 1.7.2019.
- Action 1 transfers a methodology for new market development, that we identified as good practice (GP). The methodology was developed and applied by the Bioscience Centre of competence located in Dusseldorf, DE. **It is about developing new industries by combining inputs the triple helix, taking care to also include demand (emerging demand): policy, research, business [supply & demand].**
- The GP methodology was decided to be applied to the development of lignin processing towards new applications.
- The recommendations made by a feasibility study on lignin were confirmed during two (2) EDP sessions organised during January 2019.
- The EDP sessions focused on
 - (1) market intelligence needs and concrete demand for lignin applications;
 - (2) quality of lignin produced in Kainuu and in which part of the added-value map it suits more;
 - (3) the gaps and opportunities in the region for valorising selected lignin applications;
 - (4) the most promising approaches for achieving lignin valorisation;
 - (5) investments, research/education and business services which could/should be prioritised.

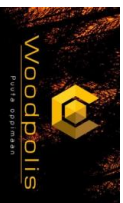


Background of the TELI project (2)

- The conclusion was that the implementation consortium should include a research unit, an end user of the lignin adhesive, and a production business that would first produce and test the lignin as adhesive for wooden construction.
- If the results of the testing proved positive, then
 - (1) investments were foreseen to boost lignin production and
 - (2) investments would be supported to introduce processing of lignin in the region. This would be done by an invitation to businesses to expand or establish lignin-processing, thus co-locate the production with the processing of lignin.

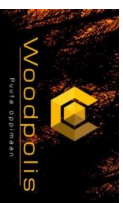


European Union
European Regional
Development Fund



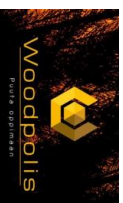
Background of the TELI project (3)

- The TELI project was selected in this context. The purpose of the TELI project was to enhance the solubility of industrial side stream lignin in Kainuu region.
- TELI main aim was to enhance the solubility of already existing lignin fractions and utilise them as glue and paint industry raw material.
- The TELI output was planned to be a proof-of-concept study (TRL1->TRL3)
- Budget 198 000 euros (Funding by Kainuun Liitto from special funding tool from The Ministry of Economic Affairs and Employment (MEAE)); first stage results ready by 7/2021.
- Co-operation to further develop TELI items continue in RDI project and target is to realise industrial investments to Kainuu based on TELI findings

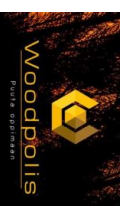
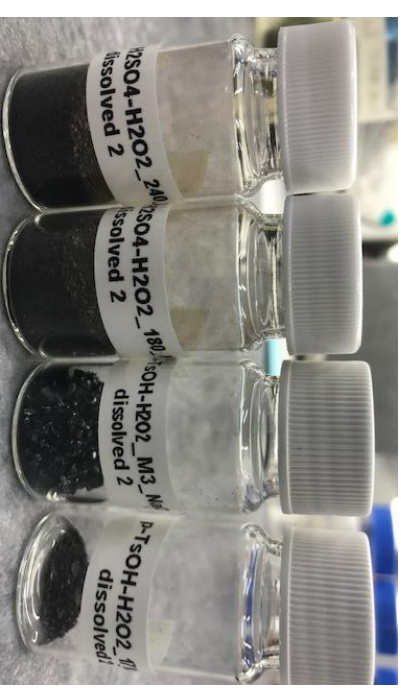
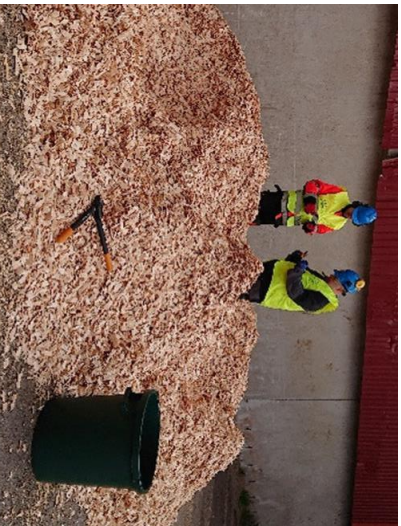


TELI Project challenge and outcome

- Advanced utilisation of hydrolysis lignin produced as bioethanol production side-stream is difficult because of its low solubility and weak reactivity
- During the TELI project a method for efficient dissolution of hydrolysis lignin was developed and tested in a lab-scale. Nearly 90% of lignin was able to dissolved (TRL 1-> TRL3)
- Next steps are process optimisation, detailed characterisation of lignin and preliminary evaluation its feasibility for industrial applications(such as bio-based glues)
- Business Finland VETURI-ecosystem funding will be applied for next step involving also more companies to the development process (value chain)



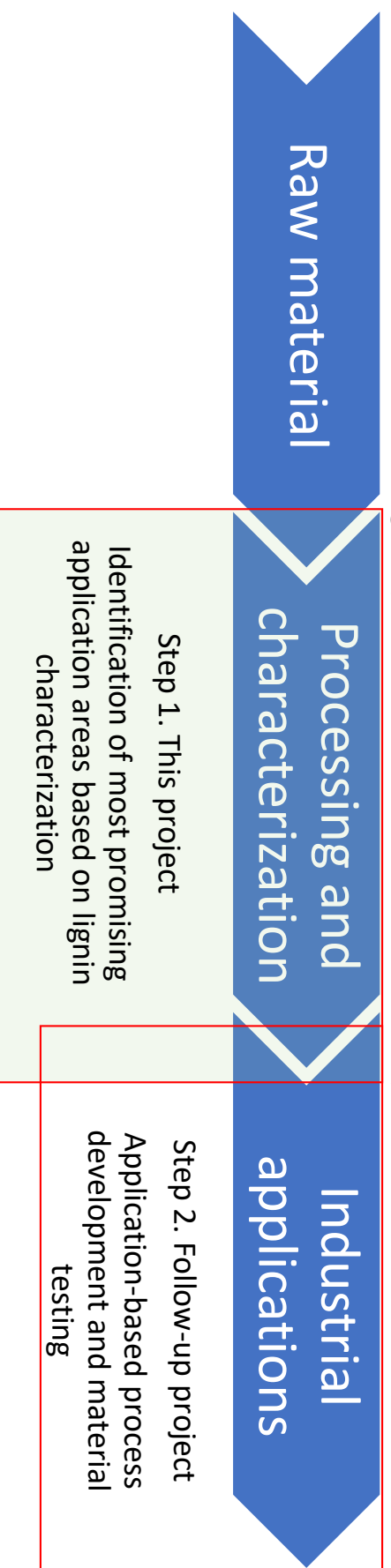
TELI Project challenge and outcome



BF Project approach: DES-based green methods for lignin extraction, modification, and purification

1. Technical lignin (hydrolysis, kraft, organosolv)

2. White lignin (DES-based fractionation of biomass)



Comprehensive molecular characterization: Composition, ^{31}P , ^1H , 2D-HSQC & ^{13}C NMR, GC-MS, HP-SEC, DSC&TG

- QUESTIONS
WELCOME



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