



ERIFORE

European Research Infrastructure
for Circular Forest Bioeconomy



This project is funded by
The European Union

Primary processing of biomass as a key step to successful bioeconomy

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ERIFORE Workshop 6.9.2016 | Leuna, Germany

Introduction

- Primary processing (PP) of forest products means the initial processing of any wood or other plant material products harvested from the forest to prepare it for shipment for further processing or to market.
- Primary processing operations shall include, but is not limited to sawmills, veneer plants, plywood plants, chipping facilities, pulp and board facilities, etc.
- Resulting primary forest products may include: whole tree logs, sawlogs, firewood, pulpwood, chips, shavings, poles, bio-char and other similar forest products.
- For biomass PP is crucial development of forest resources and market conditions. A hidden Goliath is energy sector (self-sufficiency and grid).
- Important are forest management and utilization, wood quality.

Forest bioeconomy without PP is Colossus on Feet of Clay

Introduction

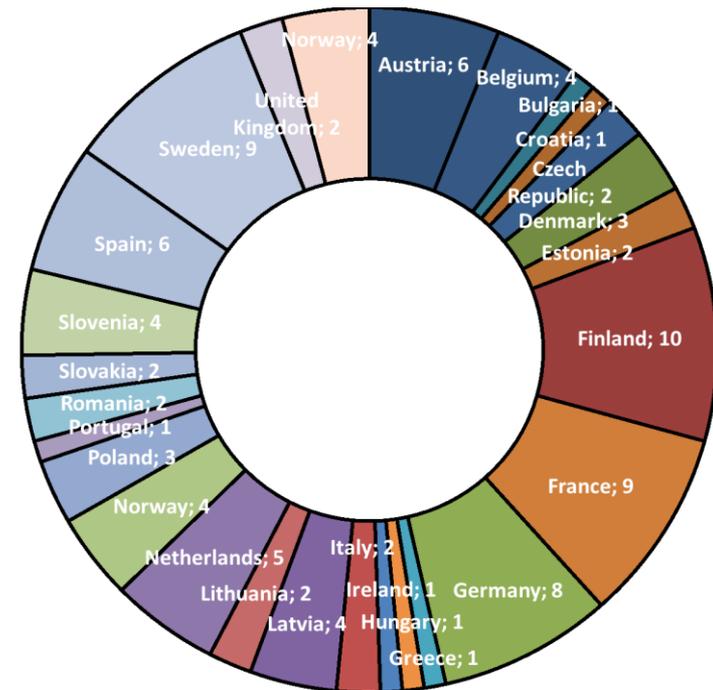
The project focuses on three areas of primary processing providing components for the next processing steps

1. **Pretreatment technologies.** The field of primary processing technologies means most often wood pretreatment and deconstruction steps in order to separate the biomass components for further processing.
2. **Pulping.** The technologies for pulping processes are further developed, but novel bioproducts, such as new lignin products, oligo/polymeric hemicelluloses or specialty fibres, often require new advanced deconstruction processes including e.g. enzymatic pre-treatments and solvent assisted fractionations. Pulping side streams (e.g. tall oil)
3. **Thermochemical conversion.** Thermal conversion technologies, such as gasification, pyrolysis (fast pyrolysis) or hydrothermal conversion are important technologies for biobased fuel components or chemical precursors production.



Expertize areas and capabilities

- 103 R&D organizations have been identified in 26 countries
 - Pretreatment and pulping: 80 %
 - Thermochemical conversion: 57 %
- The most represented countries are Finland, Sweden, France, Germany, Austria, Spain , The Netherlands, Norway, Belgium, Latvia and Slovenia.
- Emerging new capabilities, e.g. new pulping methods, thermochemical process technology, hydrothermal treatment, supercritical extractions.
- ERIFORE Partners are well represented.



Research facilities

- Most identified organisations have the expertise to carry out R&D on technologies of pretreatment, pulping or thermochemical conversion at laboratory scale.
- Many pilot scale facilities are established to develop gasification and pyrolysis technologies aiming to new process solutions on gas selectivity, gas purification, optimization of the process parameters, and solutions to reduce emissions and investments costs.
- Pretreatment and pulping pilot scale facilities have been identified only in a few countries. The same is with unconventional thermochemical processes (e.g. hydrothermal, torrefaction, solvolysis)
- *The ERIFORE public deliverable reports (D2.1, D2.2) provide more detailed information on the primary processing research infra.*



Co-operation networks

- The main networking activities in primary processing are generally supported by well-established European programs such as COST Actions and more recently through R&D collaborative projects under joint programming actions such as Wood Wisdom, ERA-net Bioenergy, or Bio-Based Industries in partnership with industry.
- European research networks are in most cases at good level. However, we should further strengthen the cooperation, cross-utilisation and awareness of research infrastructures.
- It is important to consider that some partners would like to strengthen cooperation with industry.



Initial thoughts about Research needs

- PP materials and energy flows analysis using sustainability indices
- PP technologies optimisation
- Integration and optimization of Biorefinery PP technologies
- Optimization of Biorefinery PP plants into clusters



Conclusions and discussion

1. Primary processing (PP) of biomass is a key step to forest circular bioeconomy.
2. Sustainable supply of biomass raw materials and market conditions are crucial factors for PP development.
3. PP depends on the availability of research infrastructure and innovation.

Discussion is based on initial thoughts and conclusions.

Acknowledgement

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 654371.

Consortium:

