
FRACTIONATION OF BIOMASS – AN ESSENTIAL STEP IN A BIOREFINERY PROCESS

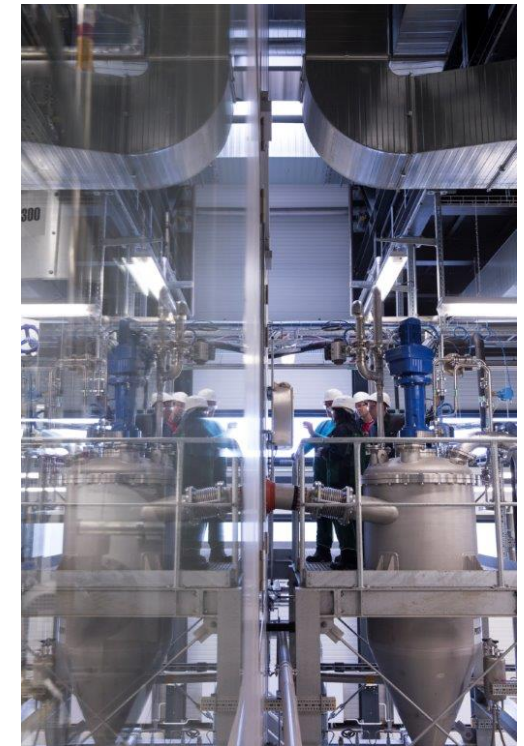
Dr. Moritz Leschinsky

Global Bioeconomy Summit

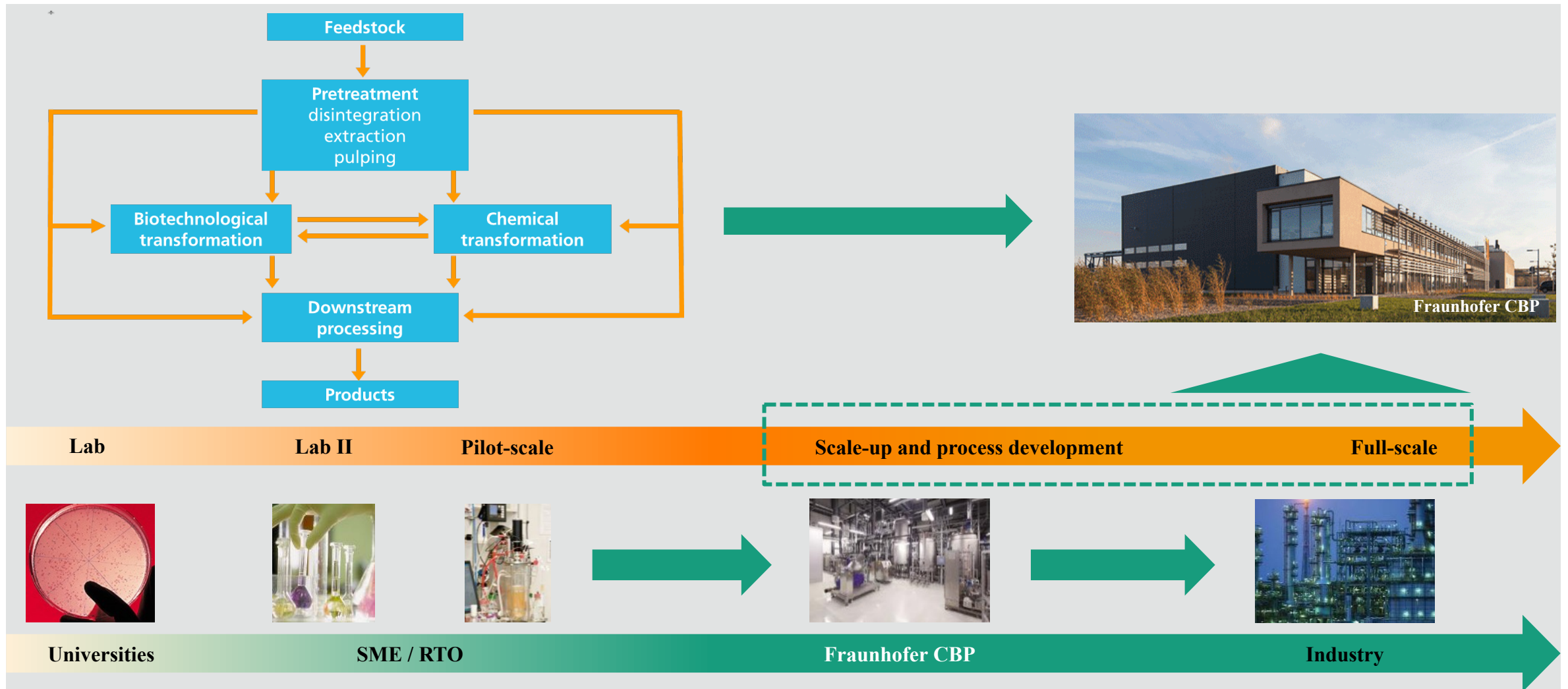
Workshop “Bioenergy and biorefineries: innovations and futures”

Berlin

19.04.2018



From laboratory to industrial scale



Approach of Fraunhofer CBP

Organosolv process, primary- & secondary products

Feedstock & consumables

Beech wood
Chips
Lignin 25%
Hemicellulose 33%
Cellulose 40%

Enzymes
(commercial)

Ethanol
(make up)
Ethanol Recovery
approx. 0,5 % losses

Organosolv Process

Primary product

Yield w/w based on
DM wood
20 %

LIGNIN

26 %

C5 Syrup

32 %

C6 Syrup

Or 35-50 %

Cellulose

Secondary product

BTX {
Benzene
Toluene
Xylene

Phenol

Vanillin

PF resins, adhesive

PUR-foams

Carbon fiber

Bioplastic, polymer blends

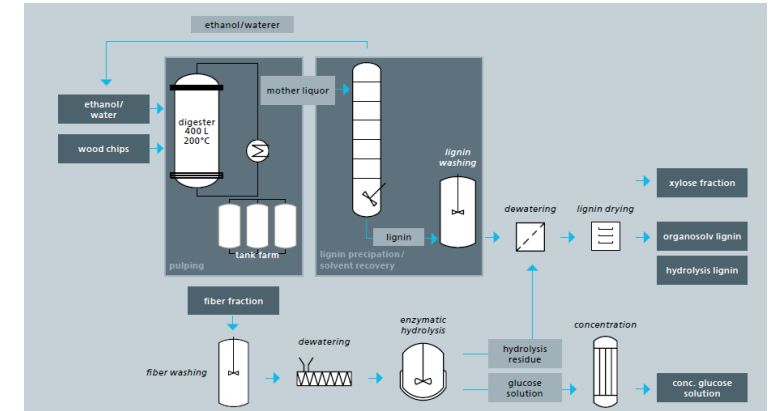
Xylitol, furfural

Various fermentations,
bioethanol

Dissolving pulp products
(textile fibers...)

Benefits of pilot-scale operation

- Since the commissioning of the “lignocellulose biorefinery pilot plant” in 2012 significant progress could be made regarding
 - Process modelling and understanding
 - Process integration
 - Process improvement (e.g. lignin precipitation, reduced pulping pressure)
 - Product characterization and application in kg scale
 - Engineering of an industrial plant
 - Scale-up of various other fractionation processes



Remaining challenges

- Industrial implementation of ethanol-based organosolv fractionation remains a big challenge because
 - The **parallel valorization & market implementation** of three intermediate products in parallel is extremely challenging
 - The concept of a “large scale” plant (300-400 kta wood) represents **investment costs** that are very **difficult to finance**, especially if it’s the first plant
 - A dedicated “**demo plant**” is difficult to finance because it represents a very high risk and will bring **no direct profit**

Conclusions & Outlook

- For the future we will focus on biomass fractionation technologies that
 - Can be operated in “standard equipment” → reduce risk and cost
 - Can be operated in an economic way even at relatively small scale
 - Delivers high value products for niche applications

Acknowledgement

Gefördert durch:



offen