

BIOPROCESS PILOT FACILITY

*Successful Bio-Economy
practices in the Netherlands*

- Introduction BPF
- Project: BioForever
- Summary

*Have your process scaled up at BPF,
a reliable and experienced pilot scale partner.*



Investing in your future.
The Bioprocess Pilot Facility is partly financed
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Raimo van der Linden

BPF: Bridging the Valley of Death of Innovation



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PILOT FACILITY

- Validation of processes & market (TRL 4-7): Use a public pilot facility!
 - Pre-installed equipment
 - Experienced operators / engineers
 - No need for investments, only rent
- BPF: Set up with help of EFRD / National / Regional funding (2012)
 - Unique in NL, one of few in EU



BPF: Keywords

- Decades of industrial experience
- > 250 pieces of equipment
- Non-profit
- Independent
- IP remains with clients
- Strict confidentiality



BPF: Areas of Expertise



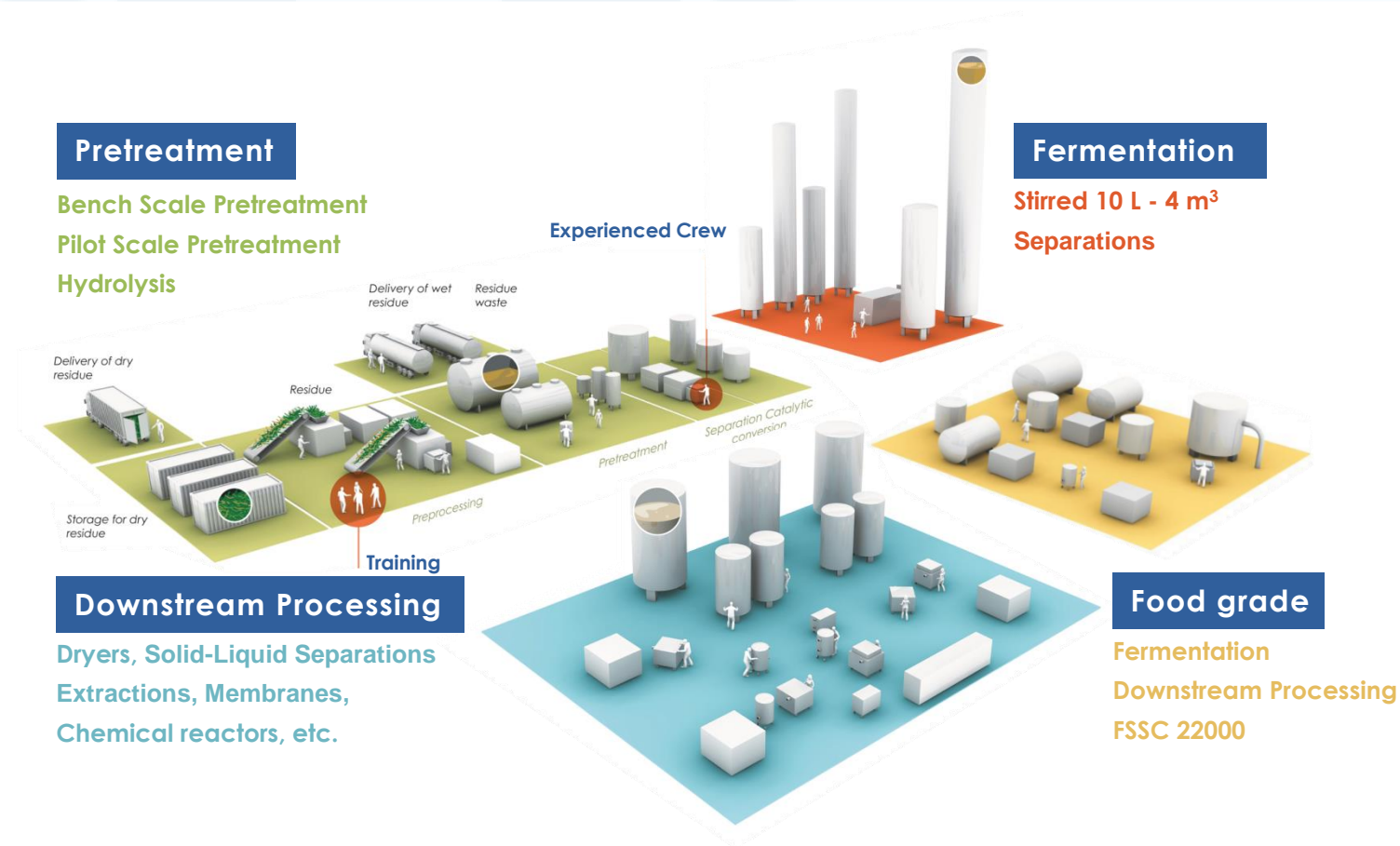
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Pretreatment

Bench Scale Pretreatment
Pilot Scale Pretreatment
Hydrolysis

Fermentation

Stirred 10 L - 4 m³
Separations



Downstream Processing

Dryers, Solid-Liquid Separations
Extractions, Membranes,
Chemical reactors, etc.

Food grade

Fermentation
Downstream Processing
FSSC 22000

BPF: Piloting in a Nutshell

- Validate technology
- Validate market
- Value proposition BPF to companies:
 - Reduce time-to-market
 - De-risk scale up of Biobased / Circular processes
- Scale down to scale up!



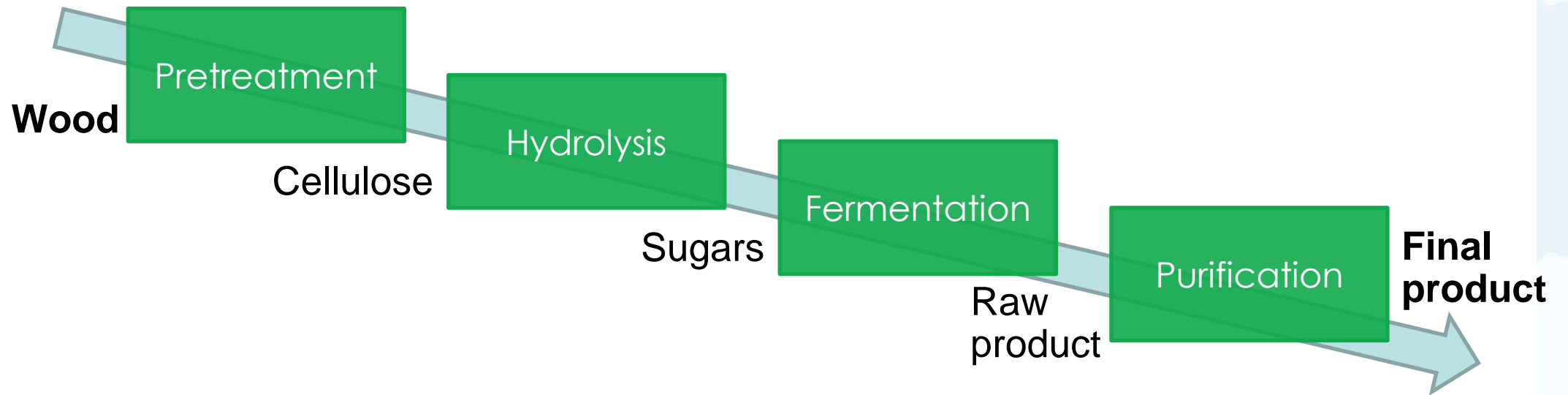
Example: BioForever project

- Bio Based Industries Joint Undertaking (BBI JU) project
- Technical and economical demonstration of different value chains from feedstock to final product
 - 2nd generation
 - Poplar, spruce, waste wood A , waste wood B
 - Wood → Sugars → Product
- <https://bioforever.org/>



BioForever: Activities BPF

- Show that sugars can be fermented at pilot scale (BPF)
 - Technology validation
 - Production of material for first application tests



BioForever: BPF Results

- Hardwoods (e.g. Poplar) more suitable than softwoods
- Sugars can be fermented to products
 - Continuous reactor & hydrolysis work well
- Process validated at TRL 5-6
 - Application tests ongoing
- Future: Biorefinery based on this concept



Summary

- BPF: Public pilot facility
 - Quickest way to reduce risks of scaling up
- Piloting 2nd Generation biorefineries:
 - 2nd Generation Biorefining receives a lot of attention
 - Possible large impact on biobased economy



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BPF is a truly multi-purpose pilot facility

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