Zero waste biorefineries: technical advances and sustainability assessment

The 1st Summer School on waste biorefineries in the context of bioeconomy, with a focus on valorization of recalcitrant side streams. A panel of specialists in the biorefinery field will provide an up-to-date state-of-the-art overview based on the latest advances in terms of scientific knowledge, techno-economical developments and life cycle assessment methodologies.

10/2016 - 09/2020

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BIO-BASED INDUSTRIES Public-Private Partnership

Bio-based Industries Consortium

Horizon 2020
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for Research & Innovation

ZELCOR SUMMER SCHOOL

Course aim

This Summer School addresses the question of biorefinery wastes in the context of bioeconomy, with a focus on valorization of recalcitrant side streams. A panel of specialists in the biorefinery field will provide an up-to-date state-of-the-art overview based on the latest advances in terms of scientific knowledge, techno-economical developments and life cycle assessment methodologies.

Course design

The course will be mainly composed of lectures with ample opportunity for discussions. Furthermore there will be poster presentations, an excursion to a Dutch biorefinery factory and the participants will have the chance to apply their acquired knowledge through case studies carried out in groups.

Course topics

- Feedstock availabilty, logistics, storage, handling and feeding
- Zero waste biorefineries: examples and needs
- Markets and products
- Functionalised packaging materials
- Biochemical conversion
- Thermochemical conversion
- Analytical techniques in biorefining with focus on recalcitrant streams
- Value chain assessment of zero waste biorefineries and their products

For this summer school, graduate school VLAG can give 1 ECTS credit for PhD students and 0,5 ECTS extra for a poster presentation.

Tentative program

Day 1

9.30 am: Welcoming and introductive presentation (Prof. Stéphanie Baumberger & Dr. Richard Gosselink)

Feedstock availability, logistics, storage, handling and feeding

- **Lignocellulosic feedstocks for biorefineries** (Dr. Stephan Piotrowski, nova-Institut GmbH)

Zero waste biorefineries: examples and needs

- **Lignocellulosic biorefineries with integrated side stream valorization: reality or future?** (Ed de Jong, Avantium BV)

Markets and products

- **Functionalities and markets for lignins** (Jairo Lora, Green Value Enterprises LLC)
- **Cosmetics needs in active biomolecules** (Fabio Apone, Arterra)
- **Feed markets for waste valorization** (Alex Obach, Skretting ARC)
- **Functionalized packaging materials** (Jérome Vachon, SABIC)

Day 2

Conversion processes and tools (Module 1 on biochemical conversion)

- **Potential of bacteria and synthetic biology for lignin conversion** (Prof. Tim Bugg, University of Warwick)
- **Microbial consortia and waste valorization** (Guillermina Hernandez, INRA)
- **Insect potential in biorefineries** (Nathalie Berezina, Ynsect)

Conversion processes and tools (Module 2 on thermochemical conversion)

- **Thermochemical processes for the production of platform biomolecules** (Daan van Es, WFBR)
- **Technical and "green" potential of ionic liquids** (Guy Marlair, INERIS & Dr. Betty Cottyn, INRA)
- **Tool box for tuning lignin structure** (Prof. Stéphanie Baumberger, AgroParisTech)

Analytical techniques in biorefining with focus on recalcitrant streams

- **Analytical tools review for lignin characterization** (Dr. Richard Gosselink, WFBR)
- **Humins: production and progress in structural investigation** (Annelie Jongerius, Avantium BV)

Day 3

Value chain assessment of zero waste biorefineries and their products

- **Value-chain environmental assessment of biorefineries** (Harriëtte Bos, WFBR)
- **Taking into account techno-economic criteria in the design of biomass conversion processes** (Elke Breitmayer, nova-Institut GmbH)
- **Safety aspects in biorefineries** (Xun Liao, Quantis)
- Site visit in the afternoon
- **Evening lecture on Biobased Economy**

Day 4

Case studies: design a zero waste biorefinery based on a lignocellulosic biomass side stream.

- Case 1: Pulp & paper mill including full valorization of side streams
- Case 2: Lignocellulosic biorefinery with focus on production of biochemicals including full valorization of side streams
- Short presentation per group on results

Summary and achievements of the workshops and conclusions of the summer school (Prof. Stéphanie Baumberger)

A separate visit to the facilities of WFBR is optional.

Organisation

Course coordinators

Dr. Richard Gosselink
(Wageningen Food & Biobased Research, The Netherlands)

Prof. Stéphanie Baumberger
(INRA, AgroParisTech, France)

Other faculty

Dr. Fabio Apone
(Arterra Bioscience, Italy)

Dr. Nathalie Berezina
(Ynsect, France)

Elke Breitmayer
(nova-Institut GmbH, Germany)

Prof. Tim Bugg
(University of Warwick, UK)

Dr. Betty Cottyn
(INRA, France)

Dr. Guillermina Hernandez-Raquet
(INRA, France)

Ed de Jong
(Avantium BV, The Netherlands)

Dr. Annelie Jongerius
(Avantium BV, The Netherlands)

Xun Liao
(Quantis)

Dr. Jairo Lora
(GreenValue Enterprises LLC, USA)

Dr. Guy Marlair
(INERIS, France)

Dr. Alex Obach
(Skretting ARC, Norway)

Jérome Vachon
(SABIC)

Registration & course fee

To register please visit **www.zelcor.eu/summerschool-registration**
Applicants will be informed of acceptance of their registration before 1 June. They will receive instructions for payment and further course details.

2 – 6 September 2018
Wageningen International Congress Centre (WICC)
Lawickse Allee 9, 6701 AN Wageningen
Wageningen, The Netherlands

Course fee includes materials, coffee/tea during breaks, lunches, an excursion and 2 course dinners but does not cover accommodation. The course fee depends on the participant's affiliation:

Course fee	
PhD candidates affiliated with VLAG	€ 250
other PhD candidates + ZELCOR members	€ 450
University staff / Non-Profit	€ 750
Industry / For-Profit	€ 1500 (*)

18-04-18

The Graduate School VLAG

Daytickets for industry participants are available upon request, email to: cornelia.vanbree-evers@wur.nl

Contact

Summer School Coordination

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