

IEA Bioenergy Task 42

Biorefining in a future BioEconomy

Newsletter 3/2017

Review “Austrian Biorefining Stakeholder Workshop“

23.10.2017

Festsaal der Technischen Universität Wien, Karlsplatz 13, 1040 Wien



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Left: Theodor Zillner/bmvit, right: Michael Mandl/tbw research

1. Introduction:

Dieses Jahr fand wieder eine Vernetzungsveranstaltung der nationalen Akteurinnen und Akteure im Rahmen des Task 42 am 23. Oktober statt. Diese öffentliche Veranstaltung initiiert pro-aktiv einen interdisziplinären Wissens- und Erfahrungsaustausch zwischen den Akteuren im Bereich Bioraffinerie. Begrüßt wurden die Gäste von Theodor Zillner vom Fördergeber bmvit. Moderiert hat Michael Mandl von tbw research GesmbH. Das Bioraffinerie Open Forum bat TeilnehmerInnen die Möglichkeit ihr Projekt oder laufende Forschungsaktivitäten in einer Kurzpräsentation einem Fachpublikum vorzustellen. Dieses Jahr waren die National Team Leader, der im Task 42 vertretenen Länder (neben Österreich auch Australien, Deutschland, Dänemark, Irland, Kanada, Niederlande und USA) mit fachspezifischen Beiträge aus den jeweiligen Ländern unter den Teilnehmerinnen und Teilnehmern. Es gab auch einen Workshopteil zum Thema „How to boost biorefining“.

On the 23rd of October, a networking event of the IEA Task 42 stakeholders took place. This public event proactively initiated an interdisciplinary exchange of knowledge and experience between different stakeholders in the biorefinery sector. The guests were welcomed by Theodor Zillner from the sponsor bmvit. The Event was moderated by Michael Mandl, tbw research GesmbH. The Biorefinery Open Forum invited participants to present their projects or ongoing research activities in a short presentation. This year, the National Team Leaders of the Task 42 participated and gave some keynote talks. A matchmaking session with the topic “how to boost biorefining” was also included at the event.

Agenda Austrian Biorefining Stakeholder Workshop:

10:00	10:15	15min	Opening and Greetings	Organizers
10:15	11:00	45min	International Keynote Status on Biorefining in USA (framework & politics, biorefinery examples, further information); incl. discussion	Borislava Kostova (US Dep. Energy)
11:00	11:45	45min	Biorefinery Open Forum - Part 1 Stakeholder pitches on biorefinery projects • 5 biorefinery pitches: 10 min each	Selected stakeholders
11:45	12:15	30min	Presentation of IEA Bioenergy Task 42 (Scope IEA Bioenergy Task 42; what will it deliver)	René van Ree (IEA Bioenergy T42)
12:15	12:45	30min	Lunchbreak	
12:45	14:00	75min	Matchmaking session Participants interaction in smaller groups	All
14:00	14:45	45min	International Keynote Biorefining in the Pulp & Paper Sector in Canada (overview, examples & feasibility , how to push forward in the P&P sector); incl. discussion	Eric Soucy (CanmetENERGY)
14:45	15:00	15min	Coffeebreak	
15:00	15:45	45min	Biorefinery Open Forum - Part 2 Stakeholder pitches on biorefinery projects • 5 biorefinery pitches: 10 min each	Selected stakeholders
15:45	16:00	15min	Wrap up- Matchmaking: How to boost biorefining; Input from national level to Task 42	All
		5min	Farewell	Michael Mandl
16:15	17:15		OPTIONAL Guided tour to visit labs & pilots at TU Vienna, Dep. of Chemical Engineering	TU Vienna staff

Overview presentations Open Forum 1+2

Open Forum 1			Titel Kurzpräsentation
Marlene Kienberger	Ass. Prof. DI Dr.	TU Graz	Bioenergy Train - A new masters program at Graz University of Technology
Markus Neureiter	DI Dr.	IFA Tulln/ BOKU	Valorization of by-products and wastes via the carboxylate platform within the projects ValorPlast and VOLATILE
Ortwin Ertl	Mag.	Annikki GmbH	Fossil chemicals are history
Ahmed Junaid Tahir	M.Sc.	AEE-Inst. Für Nachhaltige Technologien	Process Intensification in Biorefineries using Membrane Distillation MD
Matthias Steiger	Dr.	ACIB/BOKU	Metabolic engineering approaches to improve the production of organic acids
Open Forum 2			
Birgit Kamm	Prof. Dr.	Wood K plus	Biobased speciality chemicals
Anton Friedl	Univ. Prof. DI Dr.	TU Wien	Lignocellulose Biorefinery and Nanolignin also potential Products
Robert Mach	Univ. Prof. DI Dr.	TU Wien	Sweet straw - production of erythritol from wheat straw
Hannes Schwaiger	DI Dr.	JOANNEUM Research	TORERO-TORefying wood with Ethanol as a Renewable Output: large-scale demonstration
Sylvain Leduc	Dr.	IIASA (Intern. Inst. For Applied Systems Analysis)	Optimal use of biomass in Europe for biofuel production

Matchmaking session „ How to boost biorefining?“

TOPICS discussed at the Austrian Biorefining Stakeholder Workshop

TOPIC 1: NETWORKING

What is important for the linking of the different biorefinery stakeholders? In the matchmaking session „Networking“, the relevance of the topic was emphasized and challenges were discussed that arise in the development of networks for biorefinery research in Austria, Europe and worldwide. Networks are relevant at various levels: along value chains, for interdisciplinary research and research at various levels of technology, but also for better co-operation between research and industry, and between different industrial sectors and stakeholders. Possible measures that can further support the expansion of biorefinery networks include networking and scientific meetings such as specific conferences, the creation of platforms that allow the exchange of information and experience, and the development of clusters and networks. Particular emphasis was placed on the need to map existing research groups and infrastructures in order to be able to set up new collaborations more efficiently.

We would like to draw your attention to the ongoing H2020 project “European Research Infrastructure for Circular Forest Bioeconomy” (ERIFORE), in which Wood K plus and 12 other research partners all over Europe join forces to build an open research infrastructure for the forest-based bioeconomy. The basis for this networking project is a comprehensive mapping of existing expertise and infrastructures in Europe. Further information about the project can be found on the homepage (erifore.eu) or on Twitter (ERIFORE EU Project). A specific network for open access pilot and demonstration facilities is currently developed in

the BBI JU project “Pilots4U”. In this context, the database of the BMWfW on Austrian research infrastructures is an interesting source of information: <https://forschungsinfrastruktur.bmwfw.gv.at>
<https://forschungsinfrastruktur.bmwfw.gv.at/de>

TOPIC 2: TECHNOLOGY

Which development needs are required from the technological perspective to support the advancement of biorefining?

In the discussion on technological perspectives it turned out that biorefinery projects are considered high risk, as are all cutting-edge technologies. The future focus needs to be on projects that are technically sound, bear a high possibility of success and feature a broad range of technologies (biochemical conversion, thermochemical conversion, ...), project scales (pilot, demonstration, commercial), feedstock inputs (woody biomass, agricultural residue, algae, ...), and fuel products (renewable hydrocarbon). This variety is able to decrease marketplace risk and potentially accelerate the overall development of the industry—reducing costs to consumers and stimulating the circular bioeconomy. Besides the needs of highly-qualified engineers, a strong collaboration between universities and industries, investments in technological platforms, ... the discussion highlighted the following specific development needs from the technological perspective, to support the advancement of biorefining in a general perspective:

- Mimicking of fossil refinery strategies to cascade limited biomass to the highest value in flexible processing plants and target premium product applications
- Biorefinery technology development needs to focus on non-conventional feedstocks (non-food biomass resources like agricultural, forest, urban, and other wastes) including CO₂ as predominant carbon source
- The upgrading of side streams and feedstocks that are currently gasified, burned or digested to higher value products should help to improve the economic performance of the CAPEX intense concepts and subsequent scale up and roll-outs of integrated value chains
- With the help of low-energy processing technologies and classical tools of process integration the performance indicators (conversion yields, product grades, ...) need to be improved at all scales and technological maturity levels
- Industrial players are requested to establish solid, long term cooperation and clearly communicate target product quantities and qualities to researchers
- Research is challenged to provide applied expertise along the whole value chain from crude feedstock to standardized products “under one roof/institution”
- More radical innovations are desired concerning feedstock / inhibitor adapted biomass processing under mild conditions considering regional feedstock availabilities (e.g. via “non-conventional” microorganisms, marine water use substituting fresh water fermentation, new reactor designs ...)
- Intensifying the research efforts on downstream processing and separation of low product concentrations
- Integration of food, feed, chemicals, fuels processing to reduce bottlenecks during scale-up and economic barriers and initiate closed carbon and nutrient cycles based on the paradigm of an ideal circular bioeconomy.
- Internationally harmonized sustainability criteria and policy frameworks are required for feedstocks, processes & products to stimulate technology development

TOPIC 3: FUTURE

What is needed to support the advancement of biorefining? The discussions within this topic made apparent, what the stakeholders think is needed to foster the development of biorefineries. In addition to a broad variety of ideas discussed, the fundamental role of consumers to promote biorefineries was repeatedly mentioned. While some stakeholders called for appropriate education measures, others favored the opportunity to raise awareness or implement market regulations. It was argued that the biorefining community should pragmatically focus on economically feasible concepts. It is emphasized that the stakeholders equated the advancement of biorefineries with sustainable development during the discussion, which might explain why they put their hope on environmentally conscious consumers.

TOPIC 4: MATCHMAKING

The participants were given a time slot for a personal informal exchange of topics of interest and to identify possibilities to work together. We hope the stakeholders made good use of the opportunity to get in touch with the international guests and representatives of the Task 42.

Einen Gesamtüberblick kommender **Veranstaltungen** der IEA Forschungsk Kooperation finden Sie unter: <https://nachhaltigwirtschaften.at/de/iea/veranstaltungen/>

Aktuelle Berichte / News finden Sie auch auf der Internationalen Task Homepage unter: <https://www.iea-bioenergy.task42-biorefineries.com/en/ieabiorefinery.htm>

***Das IEA Bioenergy Task 42-Team wünscht Ihnen
viel Vergnügen beim Lesen und einen
besinnlichen Advent!***

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