



www.bio-based-conference.com

12th

International Conference on Bio-based Materials

15–16 May 2019, Maternushaus, Cologne, Germany

Focus: Bio-based Building Blocks & Polymers + Biodegradable Solutions + Bio-based Fine Chemicals + Innovation Award



Organiser



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www.clib2021.de

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Conference Journal

HIGHLIGHTS OF THE WORLDWIDE BIOECONOMY

One of the leading and established international conferences on bio-based chemicals and materials

- Vision & Policy
- Bio-based Building Blocks
- Bio-based Polymers
- Biodegradable Solutions
- Biorefineries
- **NEW** Bio-based Fine Chemicals (Food Ingredients, Flavours, Body Care, Cosmetics, Pharmaceuticals)
- Innovation Award „Bio-based Material of the Year 2019“
- 5 workshops – prior, at and after the conference



**bio-based-
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Pictures: J.Rettenmaier & Söhne, BASF, nova-Institute

www.bio-based-conference.com

12th International Conference on Bio-based Materials

15–16 May 2019, Maternushaus, Cologne, Germany

Your Conference Team



Michael Carus
CEO
michael.carus@nova-institut.de



Dominik Vogt
Conference Manager,
Exhibition
+49 (0)2233 4814-49
dominik.vogt@nova-institut.de



Seena Koyadan
Innovation Award
+49 (0)2233 4814-79
seena.koyadan@nova-institut.de



Jutta Millich
Media & Partnerships
+49 (0)561 503580-44
jutta.millich@nova-institut.de



Asta Partanen
Sponsoring
+49 (0)2233 4814-59
asta.partanen@nova-institut.de



Vanessa Kleinpeter
Contact, Registration
+49 (0)2233 4814-40
vanessa.kleinpeter@nova-institut.de

Venue & Accommodation

Maternushaus Cologne
Kardinal-Frings-Str. 1–3
50668 Cologne, Germany
+49 (0)221 16310
info@maternushaus.de

Further hotels you'll find here.
<http://bio-based-conference.com/venue>



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RealTime Comments

Join at [sli.do #2019BMC](https://sli.do/#2019BMC)

Twitter



#2019BMC

Free WIFI



Network ID: nova-conference
Password: nova2019

Match Making

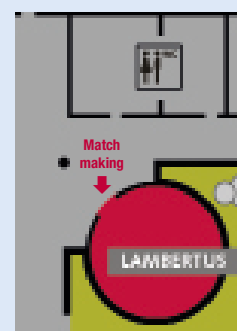
Every registered participant has received a link to the match making landing page to activate the match-making tool. After you have been logged in successfully you can directly arrange meetings with other participants of your choice.

- Meet decision makers of the Industry – 1-on-1
- Find new networking and business opportunities
- Arrange meeting place & time with ease
- Manage all your meetings in one simple user-friendly environment
- Get email alerts for meeting requests

You are not yet registered or you have questions about the match making tool? Svenja Geerken will help you:



Svenja Geerken
svenja.geerken@nova-institut.de



Preface

Dear participants,



Michael Carus
CEO nova-Institute

Welcome to the 12th International Conference on Bio-based Materials in Cologne, one of the biggest B2B events of the year. We invite you to discover and experience the most exciting new developments and strategies in the bioeconomy!

Evolution of the Bioeconomy – Survival of the Fittest? Learning from Success.

Despite the harsh environment, a few innovative companies find markets for their new bio-based building blocks, chemicals and polymers. We will introduce you to the technology leaders our planet needs for a sustainable future. We have worked closely with CLIB (www.clib2021.de/en) on this year's conference and workshop programme and would like to express our sincere thanks for the good cooperation. We expect new record numbers with 250 participants and 30 exhibitors, mainly from industry.

What are the latest technological and market developments in bio-based building blocks and polymers? What drives their development?

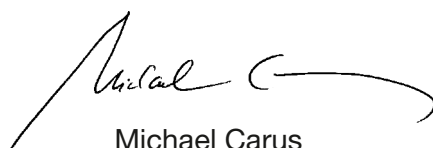
The new double session on fine chemicals shows what's happening in this intriguing area: Bio-based solutions with special features and properties, for food ingredients, flavours, body care, cosmetics or pharmaceuticals. They will conquer the market because they not only have a lot to offer but also are the first representatives of a new sustainable green chemistry. Modern biotechnology plays a crucial role in this field.

Another focus is put on biodegradable plastics, which so far received little political acceptance as an end-of-life solution. What do they have to offer? A double session shows the world's leading companies. We are particularly looking forward to UNICEF's contribution in introducing biodegradable packaging to Africa.

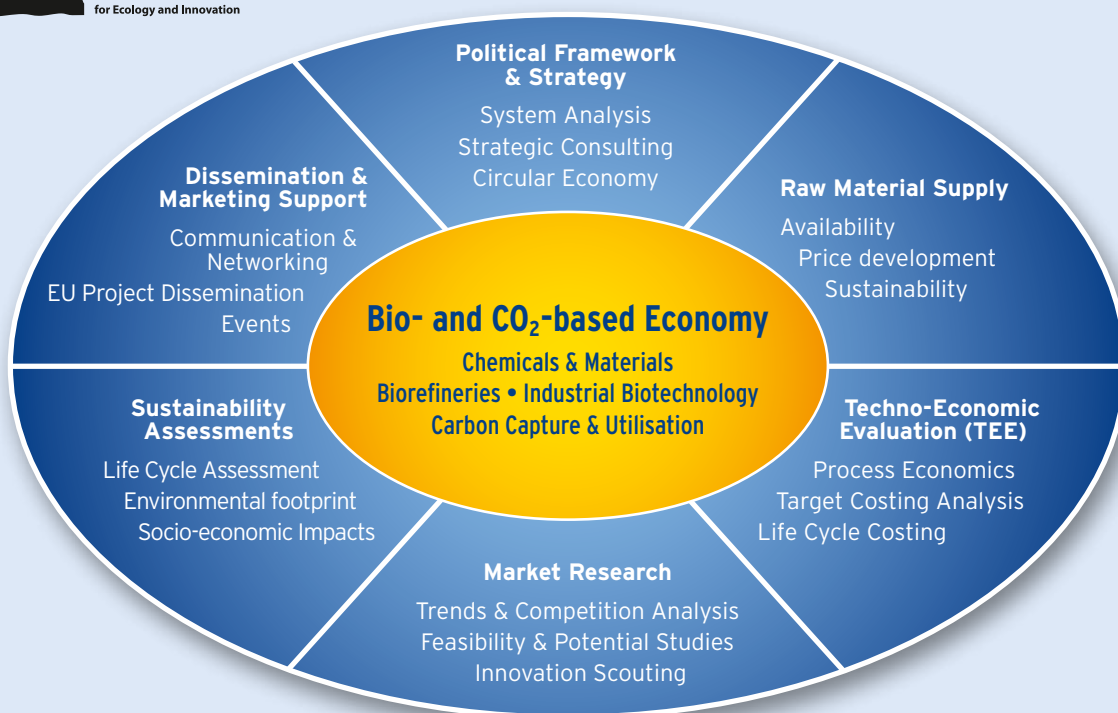
An annual highlight of the conference will once again be the presentation of the Innovation Award "Bio-based Material of the Year" – who of the participants will win this year?

The nova team wishes you an exciting and inspiring conference and fruitful networking.

Best regards



Michael Carus



nova-Institute (www.nova-institut.eu) is a private and independent research institute, founded in 1994; nova offers research and consultancy with a focus on bio-based and CO₂-based economy in the fields of food and feedstock, techno-economic evaluation, markets,

sustainability, dissemination, B2B communication and policy. Every year, nova organises several large conferences on these topics; nova-Institute has 30 employees and an annual turnover of more than 3 million €.

Advisory Board of the Conference Programme



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Wageningen University



Jörg Müssig
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Thomas Schwarz
CLIB



Ludo Diels
Flemish Institute for Technological Research (VITO)



Jan Ravenstijn
Jan Ravenstijn Consulting



Haralabos Zorbas
IBB Netzwerk



19 valuable comments on Bio-Based Materials

Bruno de Wilde, OWS

“Biodegradable plastics have been presented as part of the plastic pollution problem and as solution. As often, the truth is somewhere in the middle. Exact information and nuancing is absolutely necessary.”

Marco Versari, Novamont

“SUP, new opportunities for compostable catering products.”

Milica Folic, Haldor Topsøe

“Ease of upscaling and attractive economics as some of the benefits of heterogeneous catalysis applied to biomass.”

Imhof, Pieter, BioBTX BV

“Imagine, all plastics in the world have been processed and are produced in a sustainable way.”

Luana Ladu, TU Berlin

“Improved and systematic foresight investigations with a focus on technologies are needed for better decision-making in the future and for enabling the bio-based economy to timely tackle existing challenges”.

Latorre Martinez, Irene Christina, Covestro

“The use of bio-based feedstocks not only as a substitute to petrochemical sources but to achieve new properties is a future oriented approach to support the sustainable development of new materials.”

Rolf Luther, Fuchs Europe Schmierstoffe GmbH

“In order to fulfil economic and ecological demands a new approach was initiated for the manufacture of modern lubricant additives. The biorefinery concept includes the conversion of waste streams into value added products.”

Gerhard Maier, Polymaterials

“Combining design of experiments, high throughput screening, and predictive models for compound development in plastics is like using jackhammers and blasting instead of pick and shovel for morning.”

Guido Meurer, BRAIN AG

“From Waste to Value.”

Prajesh Mistry, Godavari Biorefineries

“Biorefining: From Biobased Feedstock to Market.”

Zdenek Moravec, Spolchemie

“Hard data – SPOLCHEMIE’s sustainability solution for both niche and big.”

Bente Nersten, Borregaard

“SenseFi, one of Borregaard newest inventions, is a multifunctional innovative dietary fiber, developed to increase the texture, mouth feel and indulgence of high quality food products.”

David Newman, BBIA – Bio-based and Biodegradable Industries Association

“Despite the UK tearing itself apart over Brexit, it has moved rapidly forward on updating its environmental strategies. This presentation looks at the challenges and opportunities those propose.”

Fabien Resweber, PTTMCC Biochem Company Lt

“BioPBS, commercially available bio-based polybutylene succinate, is now accelerating development of bio-based and home compostable solution for the market.”

Stephan Roest, Corbion

“Corbion is currently scaling-up its production of FDCA to allow for further market seeding and supply into joint development partnerships.”

Martien van den Oever, Wageningen UR

“Can we harmonize all bio-based product chains in view of regulations and standards? – Value chains in the bio-based economy face similar but also different future challenges when it comes to regulations, codes and standards.”

Hans van Klink, Dutch Sustainable Development BV

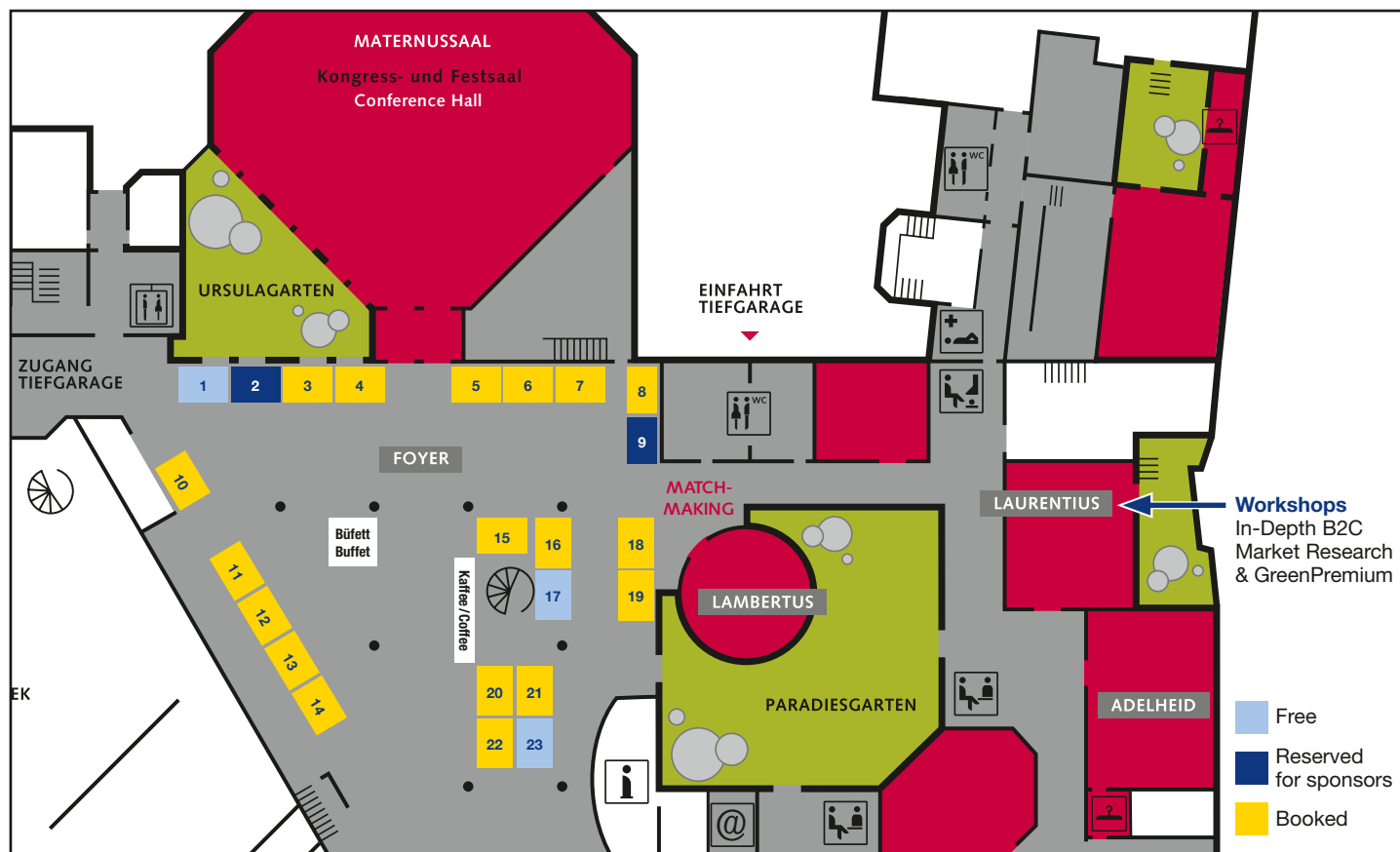
“Direct Processing with Betaprocess: starting point for using sugar beet as raw material for the (bio-)chemical industry and as crop for the most attractive circle economy model.”

Sophie van Schoubroeck, VITO

“The integration of environmental, social and economic impacts is crucial to understand, monitor and improve sustainability of products and technologies.”

Andreas Worberg, Novo Nordisk Foundation Center for Biosustainability

“Bringing ideas to commercial products in the bio-based economy – this needs a holistic approach of innovative process development, state-of-the-art strain construction and engineering and proactive business development. All of that needs to be carried by a persistent sustainable vision to bring it to life.”



Exhibition and sponsoring opportunities

The fee of a booth (6 m²) is 500 EUR (excl. 19% VAT). We provide you a table, table cloths, a pin board, a chair and a power connection. You are welcome to use your own booth system. **After booking your booth** please submit Mr. **Dominik Vogt** a printable logo and a company profile.

All **sponsoring** opportunities are available for download:

http://bio-based-conference.com/wp-content/uploads/2019/01/19-01-21_BMC_Sponsoring-Letter-1.pdf

Exhibitors

(latest list online here: <http://bio-based-conference.com/exhibitors>)

Booth

- | | |
|---|--|
| 3: Fachagentur Nachwachsende Rohstoffe e.V. (FNR) | 14: nova-Institut |
| 4: CLIB (Cluster Industrial Biotechnology) | 15: B.R.A.I.N. |
| 5: Fraunhofer UMSICHT | 16: Surface Measurement Systems |
| 6: Neste | 18: Arctic Biomaterials Oy |
| 7: InfraserV-Knapsack | 19: Match Making |
| 8: Media Table | 20: Enterprise Europe Network in North Rhine-Westphalia – NRW.Europa |
| 10: VanBerkel Consultancy | 21: J. Rettenmaier & Söhne |
| 11: FKUR Kunststoff | 22: DIN CERTCO Gesellschaft für Konformitätsbewertung |
| 12: Bio Base Europe Pilot Plant | |
| 13: Forschungszentrum Jülich | |

(Update: 29 April 2019)



International Conference on Bio-based Materials

15–16 May 2019, Maternushaus, Cologne, Germany

14 May 2019 Workshops day prior	15 May 2019 Conference 1 st day	16 May 2019 Conference 2 nd day	17 May 2019 Workshops day after
09:00 Regulation and Standardisation 14:30 Biotechnology from China	09:30 Vision & Policy 13:20 Bio-based Building Blocks & Polymers 13:20 Bio-based Fine Chemicals 17:20 Innovation Award	09:00 Industrial Biotechnology 11:15 Workshop on consumer perceptions 11:10 Biodegradable Solutions	09:00 Building a Biorefinery 09:00 Lignocellulosic Biorefinery

The day prior to the conference, 14 May 2019

Workshops* in Room Laurentius

 **09:00 – 14:00** Stakeholder Workshop STAR4BBI: Assessing Bio-based Product Value Chains – How Better Regulation and Standardisation can Promote a Level Playing Field

At the STAR4BBI stakeholder workshop, the current regulatory and standardization barriers of bio-based economy, as well as a forecast analysis of future technologies and barriers expected, will be presented. Suggestions for overcoming these barriers will be discussed.

We invite you to participate at the workshop and to interact on our suggestions for overcoming these barriers. The project partners welcome your input on the proposals for a future supportive regulatory and standardization framework.

For more information about the event:

www.nova-institute.eu/star4bbi/workshop

 **14:30 – 18:30** CLIB Workshop* on Biotechnological Solutions from China

In this workshop biotechnological solutions for several application fields like cosmetics, personal care, food, feed and agriculture will be presented and discussed. Chinese companies and institutes of the Chinese Academy of Science will give insight into cutting edge developments.

For further information please contact Dennis Herzberg (CLIB, herzberg@clib-cluster.de)

***Participation in the workshop is free of charge; the number of participants is limited and prior registration is obligatory.**

The day after the conference, 17 May 2019

Workshop* in Room Laurentius

 **09:00 – 13:00** Stakeholder workshop PULP2VALUE: The Difficulties of Building a Biorefinery and How to Avoid Them

The ultimate goal of the PULP2VALUE project funded by BBI JU is to design a fully integrated biorefinery based on sugar beet pulp. In this workshop the project team will present the experiences of this exciting journey of the last 4 years and discuss with the audience the challenges, risks and pitfalls of building a biorefinery. Participants are invited to contribute their feedback and recommendations in order to organise a constructive and fruitful workshop. For more information about the event:

www.pulp2value.eu/workshop

Workshop* in Room Adelheid

 **09:00 – 13:00** BIOFOREVER: Feasibility of a European Lignocellulosic Biorefinery

The goal of the BIOFOREVER project is to demonstrate the feasibility of an European biorefinery for the production of lignocellulosic sugars, lignin/lignosulfonates and other (downstream) products including carbon binders, enzymes, ethanol, butanol, FDCA, nano-celluloses and resin acids. Various technologies for the conversion of woody biomass to lignocellulosic sugars are presented and discussed such as API Europe's AVAP technology, Avantium's DAWN Technology, Borregaard's BALI technology and BPF's mild acid/steam explosion technology.

The intention of the workshop is also to create interest amongst workshop participants to explore participation in biorefinery projects as feedstock suppliers, for the off-take of ethanol, cellulosic sugars or other bio-based products and/or as investors.

For more information about the event:

www.bio-based.eu/bioforever

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14 May 2019
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09:00–18:30

15 May 2019
Conference 1st day

09:30–18:30

16 May 2019
Conference 2nd day

09:00–17:00

17 May 2019
Workshops day after

09:00–13:00

Programme of the 1st day, 15 May 2019

Maternussaal



09:30 **Opening:**
Michael Carus
nova-Institut

Vision & Policy



Chairperson
Ludo Diels
Vito



09:40 **David Newman**
Bio-Based and Biodegradable Industries Association (BBIA)
The UK – Despite Brexit a lot of Good News on the Bioeconomy



10:00 **Prajesh Mistry**
Godavari Biorefineries
Biorefining – From Feedstock to Markets



10:20 **Edgard Seikaly**
UNICEF
Shared Sustainability Values – Introduction of Bio-Compostable Plastic Bags in Africa



10:40 **Maria Carcolé**
Neste
How to Widen the Range of Bio-Based Materials While Assuring Sustainability



11:00 **Irene Cristina Latorre Martinez**
Covestro
Sustainability at Covestro Makes the World a Brighter Place: Using Bio-Based Feedstocks to Achieve New Material Properties



11:20 **Michael Carus**
nova-Institut
European Plastic Policy, Renewable Carbon and Biodegradation

11:40 **Questions & Answers**

11:50 **Lunch Break**

Bio-based Building Blocks & Polymers



Chairperson
Axel Barrett
Bioplastics News



13:20 **Doris de Guzman**
Tecnon OrbiChem
Bio-Based Building Blocks: 2019 Commercialisation Updates



13:40 **Pia Skoczinski & Raj Chinthapalli**
nova-Institut
Latest Market Data on Bio-Based Polymers



14:00 **Milica Folic**
Haldor Topsøe
Bio-Based MEG: First Learnings and Results from the MOSAIK™ Demonstration Plant



14:20 **David Sudolsky**
Anellotech
Commercialising Cost-Competitive, Renewable Aromatics for Bio-Based Chemicals and Fuels



14:40 **Jesper van Berkel**
Avantium
New Ways to Achieve Sustainability with PEF

15:00 **Questions & Answers**

15:10 **Coffee Break**



Chairperson
Gudbrand Rødsrud
Borregaard



15:30 **Stephan Roest**
Corbion
Corbion's Biocatalytic Pathway to FDCA for PEF Bioplastic



15:50 **Stefan Krawielitzki**
AVA Biochem
5-HMF, the Key to Bio-based Furan Chemistry

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16:10 Jouni Lattu
VTT

Unique Sugar Acid Pathway to FDCA



16:30 Pieter Imhof
BioBTX

Full Circularity Enabled: Sustainable, Cost Competitive Production of Platform Chemicals



16:50 Zdenek Moravec
Spolchemie

EnviPOXY(R) – Sustainable Solution for Epoxy Applications

17:10 Questions & Answers



16:10 Marc Struhalla
c-LEcta

Cell-free Synthetic Biology for the Production of Functional Food Ingredients



16:30 Sophie van Schoubroeck
VITO

Sustainability Analysis of an Algae-based Value Chain in North-West Europe



16:50 Hans van Klink
Dutch Sustainable Development

Prospects of Sustainable Feedstock Production for Advanced Building Blocks

17:10 Questions & Answers

Parallel session

NEW: Bio-based Fine Chemicals

(Food Ingredients, Flavours, Body Care Cosmetics, Pharmaceuticals)

Room: Drei-Königs-Saal (1st floor)



Chairperson
Dennis Herzberg
CLIB



13:20 Roland Breves
Henkel

New Materials for the Cosmetics Industry – Needs and Requirements



13:40 Babette Pettersen
Ginkgo Bioworks

Synthetic Biology for New Bio-Based Fine Chemicals



14:00 Jacco van Haveren
Wageningen UR/Food and Biobased Research

Environmentally Benign Synthesis of Cosmetic and Food Ingredients



14:20 Cara Tracewell
Zymergen

Applying Molecular Technology to Industrial Strain Optimization for Bio-based Chemical Fermentation



14:40 Andreas Worberg
Novo Nordisk Foundation Center for Biosustainability (DTU Biosustain)

Having the End in Mind – Commercialisation of Bio-based Chemicals in a Translational Core

15:00 Questions & Answers

15:10 Coffee Break



15:30 Dennis Uebel
ALTANA

Biotechnology in the Field of Specialty Chemicals



15:50 Bente Nersten
Borregaard

Vanillin and a new Advanced Texture System (SenseFi) for Food from a Spruce-Based Biorefinery

Innovation Award



Chairpersons
Asta Partanen & Michael Carus
nova-Institut

17:20 Opening Award-Session

Further information on the topics presented can be found on **page 14**.



17:30 Jaydeep Mandal
Aarkar Innovations

Anandi Eco+ – 100% Compostable Sanitary Pads



17:40 Clémentine Arnault
Carbiolice

EVANESTO® – Zero Impact Plastic Using Enzymes



17:50 Sebastian Meyer
Golden Compound

HOMEcap – Home Compostable Capsule



18:00 Warren Grigsby
Scion Research

Ligate Adhesive Technology



18:10 Juha Salmela
Spinnova

Spinnova – Sustainable Cellulose-Based Textile Fibre



18:20 Niklas Garoff
Stora Enso

Lineo™ – Alternative for Petroleum-Based Products

18:30 Beer Reception | Sponsored by nova-Institut

20:00 Gala Dinner Buffet & Live Jazz Music

21:00 Award Ceremony

22:30 Traditional German Bowling

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14 May 2019
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09:00–18:30

15 May 2019
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09:30–18:30

16 May 2019
Conference 2nd day

09:00–17:00

17 May 2019
Workshops day after

09:00–13:00

Programme of the 2nd day, 16 May 2019

Industrial Biotechnology



Chairperson
Haralabos Zorbas
IBB Netzwerk



09:00 Guido Meurer
B.R.A.I.N.

Introduction to the German Research Project "ZeroCarbFP"



09:10 Marc Gauert
B.R.A.I.N.

*Production of Bio-Malic Acid Employing the Smut Fungus *Ustilago Trichophora**



09:25 Esther Gabor
B.R.A.I.N.

Bio-Based Recovery of Precious Metals from Secondary Resources



09:40 Edda Höfer
Südzucker

CO₂ as Carbon Source for Bio-Based Chemicals



09:55 Rolf Luther
Fuchs Schmierstoffe

Biotechnological Production of Lubricant Additives from Renewable Resources

10:10 Questions & Answers

10:25 Coffee Break



10:55 Asta Partanen
nova-Institut

GreenPremium for Bio-Based Products and In-Depth Psychological Market Research for Insights into Consumers' Mindset

11:20 Parallel Workshop on consumer perceptions in Room Laurentius



Asta Partanen
nova-Institut

Markus Kueppers
Anja Irlenbusch
september

Biodegradable Solutions



Chairperson
Wolfgang Baltus
Precise



11:15 Bruno de Wilde
OWS

Biodegradation, one Principle, many Nuances: Overview and Latest Developments



11:35 Michael Carus
nova-Institut

For Which Applications do we need Biodegradations as an End-Of-Life Solution?



11:55 Carmen Michels
FKuR

Circular Economy: Closing the Loop with Bioplastics



12:15 Marco Versari
Novamont

Positioning of Compostable Polymers within SUP and ECHA, Special Outlook on Southern Europe

12:35 Questions & Answers

12:50 Lunch Break



International Conference on Bio-based Materials

15–16 May 2019, Maternushaus, Cologne, Germany



14:10 Jan Ravenstijn
Jan Ravenstijn Consulting

PHA-Platform – the Global Organization for PHA: GO!PHA



14:30 Phil van Trump
Danimer

Nodax™ PHA: Technology Updates & the Road to Commercialisation



14:50 Fabien Resweber
PTTMCC Biochem Company

BioPBS, Renewable Carbon Based Polyester for Efficient Management of Plastic Packaging End-of-life



15:10 Elisabeth Stanger
Lenzing

Circular Economy – Sustainable Solutions from Biorefinery Products and from Cellulosic Fibres

15:30 Questions & Answers



15:40 Gerhard Maier
Polymaterials

How to Make the Best of PLA and PBS: Optimising Bio-Based Blends and Compounds with High Throughput Screening and Predictive Models



16:00 Albrecht Läufer
BluCon Biotech

2nd Generation Lactic Acid – Fermentation of Cellulosic Substrates by Caldicellulosiruptor sp.



16:20 Martien van den Oever
Wageningen Food & Biobased Research

Luana Ladu
Technischen Universität Berlin
Improved Standards and Regulations to Support Bio-based Industry (European Project STAR4BBI)



16:40 Questions & Answers

16:50 End of the conference and after conference meeting point in a Cologne brewhouse

14 May 2019 Workshops day prior	15 May 2019 Conference 1 st day	16 May 2019 Conference 2 nd day	17 May 2019 Workshops day after
09:00 – 18:30	09:30 – 18:30	09:00 – 17:00	09:00 – 13:00

The day after the conference, 17 May 2019

Workshop* in Room Laurentius



09:00– 13:00 Stakeholder workshop PULP2VALUE: The Difficulties of Building a Biorefinery and How to Avoid Them

More information about this workshop can be found on **page 7**.

Workshop* in Room Adelheid



09:00– 13:00 BIOFOREVER: Feasibility of a European Lignocellulosic Biorefinery

More information about this workshop can be found on **page 7**.



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International Conference on Bio-based Materials

15–16 May 2019, Maternushaus, Cologne, Germany

Innovation Award “Bio-based Material of the Year 2019”

“Top 6” candidates nominated!

For the 12th year in a row, the Innovation Award “Bio-based Material of the Year” will be granted to the young, innovative bio-based chemicals and materials industry for finding suitable applications and new markets for their products.

The winners will be elected at the “12th International Conference on Bio-based Materials”, 15–16 May 2019 in Cologne (Germany). Six new materials and products from six different countries out of twenty-one applications have been nominated for the innovation award by the members of the advisory board.



The three winners will be elected by the participants of the conference and awarded with a prize, sponsored by **InfraServ GmbH Knapsack**, at the festive dinner buffet.

Nominees for the Innovation Award “Bio-Based Material of the Year 2019”

12th International Conference on Bio-based Materials
15–16 May 2019, Maternushaus, Cologne, Germany

Aakar Innovations (India)
Anandi Eco+ – 100% Compostable Sanitary Pads



CARBOLICE (France)
EVANESTO® – Zero Impact PLastic Using Enzymes



Golden Compound (Germany)
HOMEcap – Home Compostable Capsule



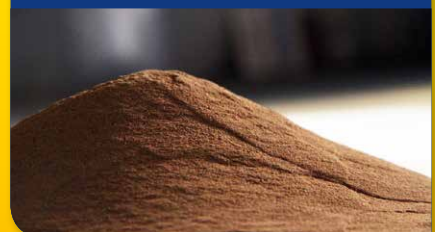
Scion (New Zealand)
Ligate Adhesive Technology



Spinnova (Finland)
Spinnova – Sustainable Cellulose-Based Textile Fibre



Stora Enso (Finland/Sweden)
Lineo™ – Alternative for Petroleum-Based Products



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Organiser
**nova
Institute**



The “Top 6” candidates are:

Aakar Innovations Pvt. Ltd.

Anandi Eco+ – 100% Compostable Sanitary Pads

Anandi Eco+ is the first and only Govt. of India Lab certified 100% compostable sanitary pad. In a compost environment, at least 90% of the pad are biodegraded within 180 days. Under other conditions in nature it takes longer respectively. The pads can be disposed easily in the backyard mud pit of any rural household to avoid polluting the environment and create bio-manure for agriculture. Aakar uses local resources like jute, bagasse, banana fibre and water hyacinth to produce their sanitary pads to reduce cost and utilizes agricultural plant waste materials. Anandi Eco+ pads do not use any harmful chemicals like SAP and convert into manure post disposal, which can be further utilised. This way, the pads contribute to environmental protection and increased resource reuse. They follow the Compostable American Standard ASTM D6400 & European Standard EN 13432. Aakar contributes to 12 out of the 17 Sustainable Development Goals of the UN through their work. More information:

www.aakarinnovations.com

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More information: www.carbiolice.com

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www.golden-compound.com

Scion – New Zealand Forest Research Institute Ltd.

Ligate Adhesive Technology

Scion's LIGATE™ is a bio-adhesive technology from 100% bio-based and sustainably grown products, including lignin, tannin and protein. It can be used to manufacture engineered wood products that do not emit volatile organic compounds like formaldehyde and that have reduced life cycle impacts compared to products made using traditional petrochemical adhesives. Water-based, non-toxic ligate adhesives are compatible with existing adhesive and panel board manufacturing equipment. Unlike other bio-based adhesives, Scion's resin does not just replace petrochemical-based components but incorporates bioinspired chemistry approaches in a scalable and very simple way to deliver a product that performs and is environmentally friendly. More information:

www.scionresearch.com



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Spinnova Oy

Spinnova – Sustainable Textile Fibre

Spinnova is a sustainable fibre company from Finland that develops ecological breakthrough technology for manufacturing cellulose-based textile fibre. Spinnova's patented technology involves zero harmful chemicals and creates no waste or side streams, making the fibre and the production method probably the most sustainable in the world. The biggest difference to other man-made cellulosic fibres is that there is no use of dissolving throughout the whole process. Spinnova's raw material commitment is to only use FSC certified wood or waste stream-based cellulose. Spinnova's objective is to globally commercialize the fibre products in collaboration with major textile brands. More information: www.spinnova.com

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Lineo™ – Lignin Alternative for Petroleum Based Products

Making up 20–30% of wood's composition, lignin is often discarded or burned during the pulp production process. However, when extracted and converted, lignin could transform the way we use natural resources to make products. In 2018, Stora Enso launched Lineo™, a renewable, wood-based, non-toxic alternative to fossil-based materials. Lineo™, Stora Enso's lignin, can be used to replace oil-based phenolic materials in a range of applications, such as in resins for plywood, oriented strand board (OSB), laminated veneer lumber (LVL), paper lamination and insulation material. Stora Enso continues to research new Lineo™ applications and is currently focused on researching its use in formaldehyde-free binders, carbon fibre and energy storage. More information: www.storaenso.com

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- Cardolite Corporation  (2018)
- Bio-Lutions  (2017)
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- Covestro  (2016)
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- HIB Trim Part Solutions  (2015)
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nova Session “CO₂ as Feedstock for Polymers”

24 September 2019

Wöhlhaf Conference Center, Terminal 1,
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What makes the utilisation of CO₂ attractive? Which role will Carbon Capture and Utilisation and renewable carbon play for sustainable fuels and chemistry? nova experts discuss possible options of CCU technologies, latest developments and the political framework.

Learn about the current state and future of CCU. Find out more.

<http://bio-based.eu/CCU-Session>



Contact

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Interview Michael Carus, CEO of nova-Institute

Michael Carus, CEO of nova-Institute, in an interview with Bio-based News on the European bio-based economy and a shift towards a renewable carbon economy



Michael Carus
CEO nova-Institute

Editor: Michael, to start us off: What is your general impression of the current state of the European bio-based economy?

Michael: Very mixed. Research and development are running at full speed, and biotechnology and chemical catalysts have continued to develop well in recent years. Despite low oil prices, the new technologies have never been

closer to profitability than today. Pilot and demonstration plants can also be financed more easily than before. But implementation, especially in the chemical and plastics industries, is difficult. The political will for high-volume implementation is lacking, and in many European countries the focus is more on technology exports than on implementation at home.

Editor: And in which sectors are things going well?

Michael: Areas that are not in direct competition with petrochemicals. This is the area of fine chemicals, such as food ingredients, flavours, body care, cosmetics and pharmaceuticals. The new building blocks offer new functions and properties that petrochemistry cannot provide in this way. Such products are allowed to be a little more expensive – in such applications, consumers reward bio-based, natural products. The other successful area is cellulose fibres for textiles due to the high demand for biodegradable natural fibres to avoid microplastics – and cotton is not only environmentally problematic but also scarce and has little room for expansion. Cellulose fibres are the fastest growing textile fibre group with about 10% CAGR.

Internally, we have taken these new developments into account by integrating a double session on fine chemicals for the first time at our major Bio-based Material Conference in May (www.bio-based-conference.com). We are also planning a large conference on cellulose fibres in February 2020.

Editor: And where is it going rather badly?

Michael: The rebirth of the bio-based economy in the 1980s had once begun to replace the entire petrochemical industry in the long term. Technologically, this would be possible today, but not without appropriate political flanking through quotas or taxes on fossil carbon. But politicians do not want to burn their fingers at chemistry: The chemical and plastics industries have considerable image problems and want to change little about their raw material base. At the same time, the use of food crops is politically taboo, even though starch and sugar crops are available at reasonable prices and do not endanger food safety. There are bottlenecks primarily in proteins. In Germany, good sugar beet locations are being phased out due to overproduction. Second generation sugar, on the other hand, will not get off the ground technologically or economically.

Looking back, it appears that the very strong research focus on biorefineries that produce fermentable sugars from lignocellulose on a large scale was a mistake. When new biorefineries are built in Northern Europe today, they mainly produce cellulose fibres (because of demand) or biofuels (because of subsidies). And we also see new concepts of small scale biorefineries.

Editor: And the biomass availability of the first generation is not a problem?

Michael: Of course, sustainable biomass will only be available to a limited extent in the future, despite all progress in efficiency and breeding, precision farming and digitalisation, without further endangering biodiversity. So we will clearly not be able to cover today's consumption of petrochemical goods including fuels (with the expected growth rates) only by biomass. Both the supply and the demand side need to change: Mobility should quickly switch to electric and hydrogen engines, which will free up biomass. The same applies to the energy sector as a whole. This will allow enough biomass to be available over a long period of time for food, feed and parts of the chemical industry.



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On top, there are now also other renewable carbon sources such as carbon capture and utilisation that will supplement the use of bio-based resources. These technologies can be used to produce fuels and chemicals using renewable energies. And that much more efficiently and on smaller areas than with biomass.

Editor: It would seem that the many roadmaps on the bio-based economy still paint a very positive picture of the future. What do you think about those kinds of initiatives?

Michael: That is true, but unfortunately, these roadmaps usually remain very general and are more of a research agenda than an implementation agenda. Concrete measures and instruments that would support a stronger market penetration are rare. Moreover, there are often considerable contradictions: while research and development are constantly developing and optimising new biodegradable plastics, the European plastics strategy then does not give them any credit in terms of contributing to the sustainable development. The market is currently in a critical phase: many companies have proactively invested in bio-based materials and products because they expected the legislator to take appropriate measures, but these are not yet coming. At the same time, criticism from NGOs rains down as soon as biomass is linked to land use. Now that policy is more focused on recycling, many companies are losing interest in bio-based. The fact that there are still success stories is due to individual brands that continue to rely on bio-based and to consumers who no longer want normal petroleum-based plastics.

Editor: Should we continue to rely on bio-based materials for a sustainable chemical future? What new strategies or alternatives do you see?

Michael: We should absolutely continue in this direction, because we need bio-based feedstocks to green the chemical industry. But we do need a new overall strategy. The bio-based economy must become part

of an overarching renewable carbon strategy, in which it represents one important pillar.

Editor: What does that mean: “a renewable carbon strategy”?

Michael: Well, look at it this way: There is a clear and more or less consistent energy policy that aims to achieve a 100 % renewable energy system based on solar, wind, hydro and other forms of renewable energy. Apart from bioenergy, all of these deserve the term “decarbonisation”, which has become quite popular as a term for our future strategy. But there is no corresponding policy or strategy for the material sector, especially for the chemical and plastic industry (even though in the policy framework of the circular economy, “decarbonisation” is also mentioned for the material sector, which I don’t think is accurate or appropriate). The term decarbonisation is sheer nonsense for organic chemistry, which is based on carbon. It is used out of lack of knowledge and as a direct analogue to the energy field. We should NEVER use it in this context! But the term is not only nonsense, it is even risky because it avoids the question of the “right” carbon sources. And this is exactly what we have to provide.

The chemical industry may only develop into a sustainable sector once it bids farewell to fossil raw materials such as crude oil, natural gas and coal for good and uses nothing but renewable carbon as a raw material in organic chemistry. The equivalent to decarbonisation in the energy sector is a transition to carbon from renewable sources in the chemical and plastics industries. It’s the only way.

Editor: And what exactly would that entail?

Michael: Renewable carbon is a collective term that includes all carbon sources that avoid or substitute the utilisation of any additional fossil carbon from the geosphere. Renewable carbon can come from the atmosphere (through carbon capture and utilisation,



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CCU), biosphere (through biomass utilisation) or technosphere (through recycling or CCU) – but not from the geosphere. These are the only three sources of renewable carbon: Recycling, bio-based and CO₂-based.

All three carbon sources are essential for a complete transition to renewable carbon, and all of them should be similarly used by the industry and be supported by politics. We should avoid brother wars among the three with only one winner: Fossil carbon! To replace all the additional fossil carbon which would be extracted in the future, we need the smartest mix of all three renewable alternatives. We need a future materials policy – a policy on renewable carbon. Which of the renewable carbon options come into play should be decided by technology and market forces and not by policy. This depends on regional factors and concrete applications.

Editor: Sounds exciting, how is this new strategy accepted by industry and politics so far?

Michael: The strategy is slowly but surely spreading like a virus. It is always difficult to develop a cross-sector policy, especially as everyone sits in their lobby silos. And you have to accept that sometimes you have to share to win. In the meantime, we have been able to convince a number of companies and political forces that share our vision and are doing new persuasive work every day.

To make the topic understandable, we are planning comics and a YouTube video this year. Everything is published on our Renewable Carbon Platform: www.renewable-carbon.eu

About Michael Carus

Michael Carus (MSc) (Germany) physicist, founder and managing director of the nova-Institute, is working for over 20 years in the field of Bio- and CO₂-based Economy. The focus of his work are market analysis, techno-economic and ecological evaluation as well as the political and economic framework for bio-based processes and applications (“level playing field for industrial material use”).

Today, Michael Carus is considered to be one of the leading experts and market researchers in Europe on Bio- and CO₂-based Economy and especially the industrial material use of biomass. He is actively involved in building networks in the fields of agricultural and forestry resources, bio-based chemicals and materials (bio-based polymers, plastics and biocomposites) and industrial biotechnology and biorefinery. Mr. Carus is a member in many societies, associations and international organisations. Carus is consultant on policy in different countries in Europe, Asia and America.

Save the Date: nova-Institute Events in 2019



5-6 June 2019
Maternushaus, Cologne, Germany
www.eiha-conference.org



14-15 November 2019
Maternushaus, Cologne, Germany
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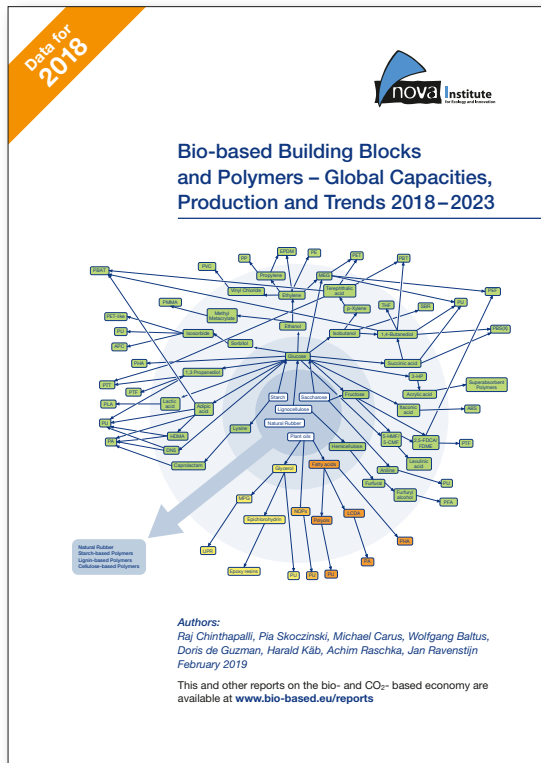
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New version with special highlights:
“Bio-based Building Blocks and Polymers – Global Capacities, Production and Trends 2018–2023”

More information starting from February 2019 at www.bio-based.eu/reports

New version with special highlights: “Bio-based Building Blocks and Polymers – Global Capacities, Production and Trends 2018–2023”

Available from February 2019

This annually updated market report gives deep insights into commercially produced bio-based building blocks and polymers. Besides a comprehensive explanation of the building block and polymer properties the report includes detailed information about producers, their manufacturing locations and their installed capacities.

For the year 2018 this market report offers very special highlights:

- Comprehensive information on capacity development from 2018 to 2023, per bio-based building block and polymer
- **For the first time production data for the year 2018, per bio-based polymer**
- Detailed functional and production-related information on a total of 17 bio-based building blocks and 16 polymers
- Analyses of market developments and producers per building block and polymer
- **Detailed research, calculation and explanation of the market development of cellulose acetate (CA), bio-based epoxy resins and bio-based polyurethanes**
- Comprehensively **updated 171 detailed company profiles** – from start-ups to multinational corporations.

With this market report the readers can quickly gain an overview of developments in the bio-based building blocks and polymers market that go far beyond capacity and production figures.

In 2018 the total production volume reached 7.5 million tonnes – these are already 2% of the production volume of petrochemical polymers. The potential is much higher, but is currently hampered by low oil prices and a lack of political support.

The market and trend report is written by the international biopolymer expert group headed by the nova Institute. The authors come from Asia, North America and Europe. The report is now available for 3,000 € at www.bio-based.eu/reports – in addition to further market studies on special areas of bio- and CO₂-based economics.



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In line with increasing awareness and urgency to work towards a circular economy, companies are continuously looking for suitable alternatives to conventional plastic solutions.

In the course of the last 40 years, polyhydroxyalkanoates (PHA) have increasingly gotten attention as a material-platform that has a big role to play. PHAs are renewable and biodegradable polymers that can add value in numerous applications and end-markets.

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Yours sincerely,

GO!PHA Executive Board,

Rick Passenier
rick.passenier@gopha.org

Jan Ravenstijn
jan.ravenstijn@gopha.org

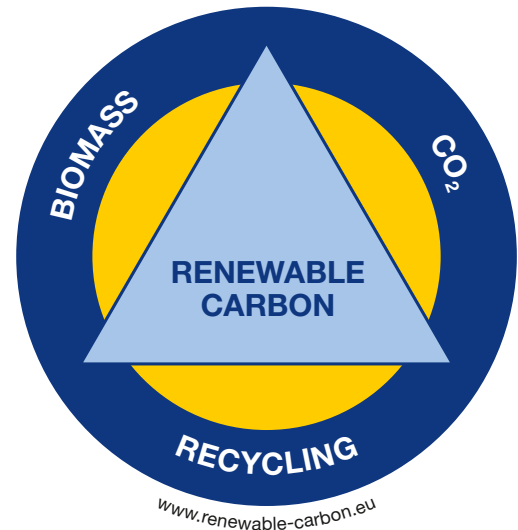
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anindya.mukherjee@gopha.org

Renewable Carbon is Key to a Sustainable and Future-Oriented Chemical Industry

The equivalent to decarbonisation in the energy sector is a transition to carbon from renewable sources in the chemical and plastics industries. The nova-Institute published a position paper on the future of chemistry.

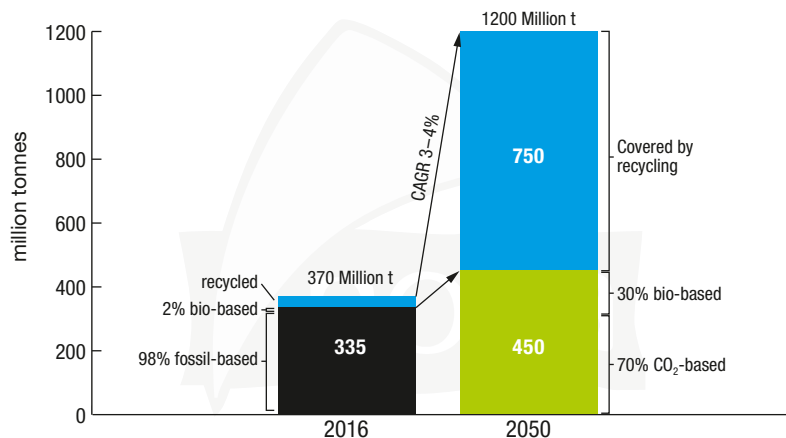
The chemical industry may only develop into a sustainable sector once it bids farewell to fossil raw materials such as crude oil, natural gas and coal for good and uses nothing but renewable carbon as a raw material in organic chemistry.

However, it is not a decarbonisation, like it is quite reasonably called for in the energy sector, that will help this industry. After all, organic chemistry cannot be decarbonised, as it is entirely based on the use of carbon. This also includes the plastics industry – the modern world is inconceivable without its versatile polymers unless you are prepared to accept considerable sacrifices or higher greenhouse gas emissions.



There are only three sources of renewable carbon: renewable carbon from recycling of already existing plastics (mechanical and chemical recycling), renewable carbon gained from all types of biomass and renewable carbon from direct CO₂ utilisation of fossil point sources (while they still exist) as well as from permanently biogenous point sources and direct air capture.

World Plastic Production and Carbon Feedstock in 2016 and Forecast for 2050 (in Million Tonnes)



The virgin plastic production of 335 Million t in 2016 will increase to 450 Million t in 2050, completely based on renewable carbon. The total demand for plastics of 1,200 Million t in 2050 will be mainly covered by recycling.



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All three sources are essential for a complete transition to renewable carbon, and all of them, in equal shares, should be used by the industry, supported by politics and accepted by the population.

In a sustainable chemical industry, bulk chemicals will primarily rely on chemical CO₂ utilisation through methane, methanol and naphtha, while specialty chemicals and complex molecules will more likely be produced from biomass (and CO₂ fermentation). At the same time, mechanical and chemical recycling will reduce the need for additional renewable carbon on the whole.

Whereas traditional recycling re-uses products and materials, the use of biomass and direct CO₂ utilisation is tantamount to a recycling process which also constitutes part of an extended circular economy.

The authors show how the complete conversion of the chemical industry to renewable carbon can look like and which cultivation areas are necessary for the biomass and renewable energy demands. A future scenario for the plastics industry might look as follows (see figure): Due to its annual growth of three to four per cent, the global production of plastics will soon reach the mark of 400 million metric tons per year.

Pronounced recycling efforts might hold the continuously growing demand for new plastics between 400 and 500 million metric tons by 2050. This need could then be covered by, for example, 30 per cent biomass and 70 per cent direct CO₂ utilisation. The total of biomass required to do so would amount to roughly 1% of biomass currently used around the globe in all fields of application (13–14 billion metric tons, of which 60 per cent alone are attributable to animal feed for the production of milk and meat).

Finally, the authors discuss thirteen concrete measures that are politically suited to initiate and accelerate the change towards renewable carbon. These include for example taxes on fossil carbon, renewable carbon quotas for bulk polymers or annual reporting by the chemical companies on their share of renewable carbon in production.

24 chemistry and plastic experts from industry and research already support this position paper, further supporters are welcome.

The full position paper, called “nova paper #10 Renewable Carbon is Key to a Sustainable and Future-Oriented Chemical Industry” (2018-08) can be downloaded in English and German at:

www.bio-based.eu/nova-papers

nova paper #10 on bio- and CO₂-based economy 2018-08

Renewable Carbon is Key to a Sustainable and Future-Oriented Chemical Industry

Authors: Michael Carus and Achim Raschka, nova-Institute, Hürth (Germany)

nova papers are proposals to stimulate the discussion on current topics of the bio- and CO₂-based economy, by creating new perceptions based on scientific facts and by inviting relevant stakeholders to participate in decision-making processes and debates.

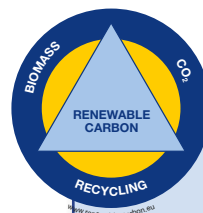
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Inspired by the Second Berlin Raw Materials Summit, 25 June 2018
[#Feedstock18](http://www.rohstoffgipfel.de)

Download this paper and further documents at:
www.bio-based.eu/nova-papers

V.i.S.d.P.: Michael Carus, nova-Institut GmbH, Industriestrasse 300, 50354 Hürth, Germany.
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- What do consumers think about the biodegradation of plastics or the use of CO₂ for fuels and mattresses?
- Do consumers make a difference between first and second-generation biomass feedstock for bio-based products?

These and other questions keep industry and policy makers busy. Their answers will have great influence on how the European bioeconomy will be shaped in the next decades. Many quantitative and semi-quantitative studies have been carried out over the last few years, but the picture is still not quite clear.

This gap is being filled now by our novel approach. Instead of conducting the xth standard survey, we provide the combined expertise of two renowned specialists in their fields to supply you with the information you really need.

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“september Strategie & Forschung”, Cologne, is one of Germany’s market leaders in deep psychological market research. Thanks to extensive in-depth interviews with consumers, it is possible to look behind the scenes of buying behaviour and find connections that remain hidden in online surveys.

september works along three guiding principles which are “professional naivety”, “open interviewing” and a “customer-centric approach”. The motto: “Insight into the Matryoshka: How in-depth market research helps you make the right decisions.”

september works for market leaders in the categories of food, fashion, retail, telecommunication and media (www.september-online.de).



“nova-Institute for Innovation and Ecology”, Hürth near Cologne, is one of the market leaders in the field of market and trend reports in the Bio-, CO₂- and Circular Economy, especially in B2B issues. Above all, nova’s market analyses on biopolymers, building blocks and CO₂ use as well as GreenPremium research are known worldwide (www.bio-based.eu).

nova-Institute has worked for companies such as: BASF, BMW, Covestro, DuPont, Evonik, Ford, Honeywell, IKEA, Lego, Mercedes, Mondi, NESTE, Porsche, REWE, Teijin, Total, Velux, Volkswagen, WWF.

“Here at nova-Institute, we are convinced that by enriching our existing comprehensive market knowledge with in-depth psychological market research methods by september, we and the bio-based economy can gain completely new insights.”

Michael Carus
Managing Director, nova-Institute

THE METHOD

To create a tailor-made study for you, we will organise a workshop together with september to discuss the specific approach based on our comprehensive expertise of the specificities of bio-based products and markets. September will conduct in-depth interviews in the European countries of your choice. The results will be discussed in a final workshop.

Guiding principles of the in-depth interviews

Professional naivety

"Childlike curiosity" as a guideline for conversational leadership

- Interviewer adopts a benevolently neutral attitude: the participant is signalled neither satisfaction nor dissatisfaction with the answers in order to largely reduce (social) desirability.
- Moderator questions the supposed self-evident.
- In particular, clichés, stereotypes, generalisations or simplifications are deliberately broken up and their underlying motives and beliefs questioned.

Open interviewing

Interview remains open to results

- No closed questions.
- Moderator takes up impulses from respondents and flexibly expands the range of topics.
- This implies a certain dynamic of the duration with which a topic is discussed - depending on the respondent, it is necessary to focus more or less on a topic.

Customer centric approach

"Focus on the customer" no empty phrase

- The conversation takes its origin in the test person, i.e. his experiences, actions, knowledge, beliefs, feelings and thoughts.
- "Least contamination" - the test person always experiences only as much new information as is necessary for a meaningful discussion of the topic to be researched.
- Timing/order of stimuli (for example material and product samples) are important: e.g. in insight studies stimuli should be shown as late as possible, in communication tests as early as possible.
- Moderator always demands answers that are as realistic and clear as possible for all questions.
- No "why" questions to avoid rationalization - rather, the question arises as to the purpose: what (hidden) purpose does it serve?

The method and its potentials will be presented in a presentation and a dedicated workshop at the **Bio-Based Materials Conference 2019**.
15-16 May 2019, Maternushaus, Cologne (Germany)

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www.bio-based-conference.com



THE RESULT

Some highlight results of the first ever application of in-depth market research on bio-based products*

What are plastics made of? Consumers generally have no idea about mineral oil being the feedstock. It is a widespread perception that plastics are “bad” and kill animals in the sea.

When it comes to plastics, the interviewees mainly thought of negative aspects, but almost no one was aware that they are made from crude oil: “Something chemical, industrial, artificial ingredient, when it comes to ingredients I don’t really know”. The respondents were very surprised to learn that plastics are actually made from crude oil and can be made of plants.

Easy thinking: plant features are projected onto the product - chemistry is “toxic magic”

The knowledge of chemistry is very low and the transformation from liquid mineral oil to solid plastic works like a miracle. Chemistry is “toxic magic”. In this way, the properties of the raw materials are transferred directly to the end products in consumers’ minds. Wood is hard, resistant and durable; analogously it should only be used to make hard, resistant and long-living products.

First generation feedstock for single-use applications

For soft and single-use applications, interviewees prefer first generation feedstocks: “Food crops are a high-quality feedstock, but they are perceived less valuable than virgin lignocellulosics since food crops grow faster.” The understandable transfer of raw material properties to the product also works for these feedstocks: “This plastic product could be made of corn, because corn feels like plastic” - so it’s only logical you can make plastic out of it. Only very few respondents were aware of the discussions on food or non-food crops for industry, which seems to be mainly a discussion in the political area.

Nobody understands “bio-based” and all plant-derived products will be biodegradable

Products made from plants are biodegradable to consumers. Meaning: It will biodegrade if one throws it in the compost or in the forest. Thus: “Everything made out of plants is environment friendly”. The term “bio” is linked to “organic”, in contrast to “bio-based”, which was not understood or misunderstood. Consumers understand “plant-based”.

Consumers want to be educated by the politics

Consumers feel overwhelmed, not competent and not responsible for the decision which materials are good or bad. Respondents wanted a simple, official and trustworthy label to help them identify the good materials. This result calls into question the numerous consumer awareness projects currently underway. Perhaps the development of a labelling system would be more helpful.

* The results were obtained in the framework of the European research project “Bioforever” which has received funding from the Bio-Based Industries Joint Undertaking under the European Union’s Horizon 2020 research and innovation programme under grant agreement No. 720710. www.bioforever.org

Interested?

Directly contact nova’s Managing Director Michael Carus for a first talk about your needs and interests.



Managing Director
Michael Carus
+49 (0)2233 - 48 14 40
michael.carus@nova-institut.de



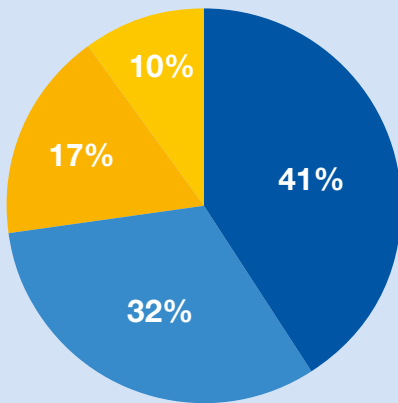
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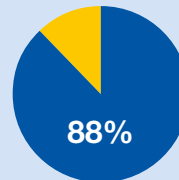
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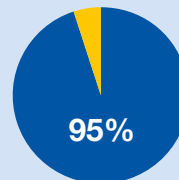


- Larger companies
- SME & Startup
- Academia
- Others

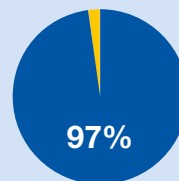
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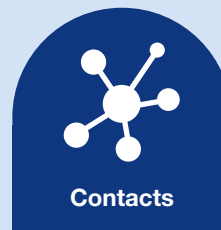


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Bio-based Polymers & Building Blocks

The best market reports available



Update 2018

Bio-based Building Blocks and Polymers – Global Capacities, Production and Trends 2018–2023

Authors: Raj Chinthapalli, Pia Skoczinski, Michael Carus, Wolfgang Baltus, Doris de Guzman, Harald Kaeb, Achim Raschka, Jan Ravenstijn
February 2019

This and other reports on the bio- and CO₂-based economy are available at www.bio-based.eu/reports

Update 2019

Carbon dioxide (CO₂) as chemical feedstock for polymers – technologies, polymers, developers and producers

Authors: Achim Raschka, Pia Skoczinski, Jan Ravenstijn and Michael Carus, nova-Institut GmbH, Germany
February 2019

This and other reports on the bio-based economy are available at www.bio-based.eu/reports

Update 2019

Succinic acid: New bio-based building block with a huge market and environmental potential?

Pharmaceutical/Cosmetic	Industrial
<ul style="list-style-type: none"> Acidic ingredient for denture cleaner/footpaste Antidote Calcium-succinate is anticonvulsant Efferescent tablets Intermediate for acetaminophen Pharmaceutical intermediates (salicylates, aspirin, phenolphthalein, antihistamine, diuretic) Preservative for latexes Retriever fish colour Used in the preparation of vitamin A 	<ul style="list-style-type: none"> De-icer Engineering plastics and epoxy casting agents/hardeners Herbicides, fungicides, regulators of plant growth Intermediate for lacquer + photographic chemicals Plasticizer (preparates phthalates, adipic acid) Rayon Solvents, lubricants Surface cleaning agent (metal/electronic-/semiconductor industry)
Food	Succinic Acid
<ul style="list-style-type: none"> Bread softening agent Flavour enhancer Flavouring agent and acidic seasoning in beverage/food Microencapsulation of flavouring oils Preservative (vitamin, dry food) Protein gelatinisation and in dry gelatine desulfurization flavourings Used in synthesis of modified starch 	<ul style="list-style-type: none"> Including aluminium Chemical metal plating, electroplating baths Coatings, inks, pigments, powder/injection-curable coating, resins for water-based paint, dye intermediate, photoconductor ink, toner Fabric finish, dyeing aid for fibres Part of antibiotic treatment for barley seeds Preservative for soil fixers Salt-softening agent
Other	

Authors: Raj Chinthapalli, Pia Skoczinski, Achim Raschka, Michael Carus, nova-Institut GmbH, Germany
Update March 2019

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Commercialisation updates on bio-based building blocks

Author: Doris de Guzman, Tecnon OrbiChem, United Kingdom
July 2017

This and other reports on the bio-based economy are available at www.bio-based.eu/reports

Standards and labels for bio-based products

Authors: Lara Dammer, Michael Carus and Dr. Asta Partanen
nova-Institut GmbH, Germany
May 2017

This and other reports on the bio-based economy are available at www.bio-based.eu/reports

Bio-based polymers, a revolutionary change

Comprehensive trend report on PHA, PLA, PUR/TPU, PA and polymers based on FDCA and SA: Latest developments, producers, drivers and lessons learnt

Author: Jan Ravenstijn, Jan Ravenstijn Consulting, the Netherlands
April 2017

This and other reports on the bio-based economy are available at www.bio-based.eu/reports

Policies impacting bio-based plastics market development and plastic bags legislation in Europe

Bioeconomy: More than Circular Economy

Authors: Dirk Carrez, Clever Consult, Belgium
Jim Philip, OECD, France
Dr. Harald Kaeb, naroccon Innovation Consulting, Germany
Lara Dammer & Michael Carus, nova-Institut, Germany
March 2017

This and other reports on the bio-based economy are available at www.bio-based.eu/reports

Asian markets for bio-based chemical building blocks and polymers

Share of Asian production capacity on global production by polymer in 2016

Author: Wolfgang Baltus, Wobelt Expedition Consultancy, Thailand
This and other reports on the bio-based economy are available at www.bio-based.eu/reports

Market study on the consumption of biodegradable and compostable plastic products in Europe 2015 and 2020

A comprehensive market research report including consumption figures by polymer and application types as well as by geography, plus analyses of key players, relevant policies and legislation and a special feature on biodegradation and composting standards and labels

Bestsellers

Authors: Harald Kaeb (naroccon, lead), Florence Aeschermann, Lara Dammer, Michael Carus (nova-Institut)
April 2016

The full market study (more than 300 slides, 3,500€) is available at www.bio-based.eu/top-downloads.

www.bio-based.eu/reports





nova Session

“EU Circular Economy and Plastic Policy”

nova Session “EU Circular Economy and Plastic Policy”

21 May 2019

Wöllhaf Conference Center, Terminal 1, Airport Cologne/Bonn, Germany

Link to registration: <http://bio-based.eu/plastic-policy-session>



With considerable speed, the Juncker Commission has presented its Circular Economy Package and the corresponding plastics legislation was drafted quite quickly by the EU institutions. The content of the legislation has given ground to confusion and speculation by industry players. How binding are the provisions? Will there be any exceptions or special regulations for bio-based or biodegradable plastics? How will it influence the industry?

Want to know what's really going on with the new European plastics policy? Join our nova Session! This is your opportunity to discuss with experts and a deeply involved Commission official.

These presentations will give you the latest information to make sound decisions:

- **Michael Carus, nova-Institute:**
Introduction to bio-based polymer markets and circular economy
- **Lara Dammer, nova-Institute:**
Specific implementation of the new plastic policy – how does it affect the sector?
- **Werner Bosmans, European Commission, DG Environment:**
Background of the plastic policy and outlook for the policy on bio-based and biodegradability
- **Constance Ißbrücker, European Bioplastics:**
Technical aspects and the view of the industry

Ample room for discussion will enable you to find out what is going on with other branches and sectors.

All information and registration can be found at: <http://bio-based.eu/plastic-policy-session>



Contact

Lara Dammer
+49 (0)2233 4814-55
lara.dammer@nova-institut.de



nova-Institut GmbH
Chemiepark Knapsack
Industriestr. 300
50354 Hürth, Germany
www.nova-institut.eu

