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13<sup>th</sup>

# International Conference on Bio-based Materials

Online Conference • 12–14 May 2020



# Conference Journal


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nova-institute.eu

## HIGHLIGHTS OF THE WORLDWIDE BIOECONOMY

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

- Success stories and upcoming technological breakthroughs in the bioeconomy
- Policy and markets
- Fine chemicals in body care, cosmetics, food ingredients and pharmaceuticals
- Circular bioeconomy, biorefineries, pyrolysis and especially lignin utilisation
- New opportunities for bio-based building blocks and polymers
- Innovation award „Bio-based Material of the Year 2020“



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



# International Conference on Bio-based Materials

Online Conference • 12–14 May 2020

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**Twitter**



**#2020BMC**

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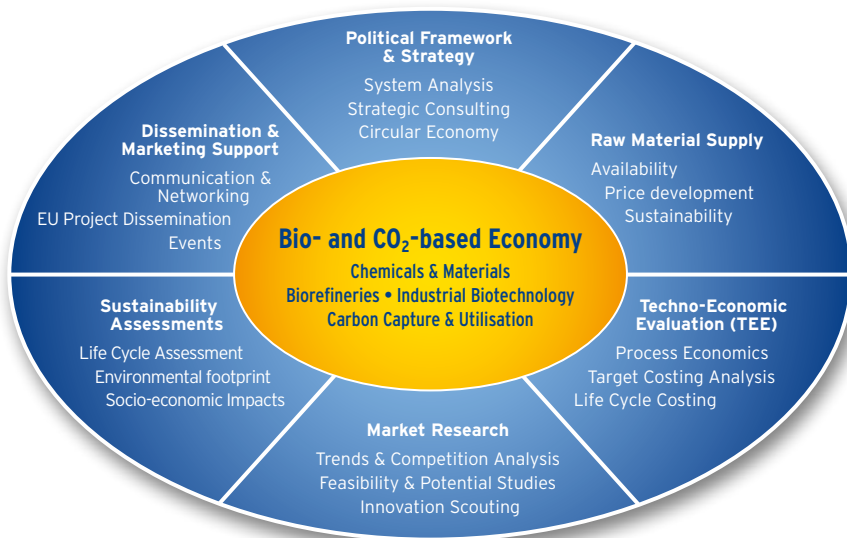
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## nova-Institute

nova-Institute is a private and independent research institute, founded in 1994; nova offers research and consultancy with a focus on bio-based and CO<sub>2</sub>-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 more than 35 employees and an annual turnover of 3 million €.

# 13<sup>th</sup> International Conference on Bio-based Materials



**Michael Carus**  
CEO nova-Institute

## **Dear participants, welcome to our first online conference on bio-based materials!**

Due to the Corona crisis, this year's conference will unfortunately not be able to take place in its established and appreciated format. But in such uncertain times, the need for exchange and cooperation within the bio-based economy is even higher than usual. Politicians and companies alike demand a greener economy after the crisis. But what are the best ways to make the chemical and plastic industry more sustainable? What role can and will the bio-based economy play in the future?

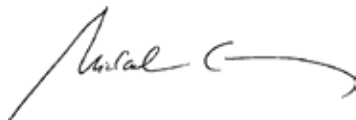
44 expert speakers from leading companies and institutes have confirmed their online presentations. Topics of the online conference are circular economy, renewable carbon, chemical recycling and latest investments in biorefineries. Information on technologies, markets and policy will be provided for bio-based building blocks and polymers. One special focus is on lignin utilisation, another on fine chemicals for pharma, cosmetics, body care & specialties.

The always highly anticipated innovation award "Bio-based Material of the Year" will be elected online by the participants. Six promising candidates out of 17 applications have been nominated by the advisory board.

After excellent experiences with the online version of the "Conference on Carbon Dioxide as Feedstock for Fuels, Chemistry and Polymers" end of March, nova-Institute is convinced that the "13<sup>th</sup> International Conference on Bio-based Materials" will be an equally successful online event. We cordially invite you to join us for the three days. We will strictly adhere to the times in the program, so that you can dial in again at any time for the desired presentation. We also invite you to participate interactively with questions and comments, we have planned plenty of time for this.

Nothing is better than meeting on-site in the real world, let's try to realise the second-best option together!

kind regards

A handwritten signature in black ink, appearing to read "Michael Carus". The signature is written in a cursive style with a long horizontal stroke at the end.

Michael Carus (CEO) and his nova team

P.S.: nova-Institute would like to acknowledge YNCORIS Industrial Services (DE) for sponsoring the renowned innovation award "Bio-based Material of the Year 2020". The Finnish companies NESTE and UPM support the conference as Gold Sponsors, CLIB (DE) supports the event as premium partner.

# Market and Trend Reports

**UPDATE 2020**

**Commercialisation updates on bio-based building blocks**

**Bio-based building blocks**  
Evolution of worldwide production capacities from 2011 to 2024

Authors: Dore de Garmen, Tecnon OROChem, United Kingdom  
February 2020  
This and other reports on the bio- and CO<sub>2</sub>-based economy are available at [www.bio-based.eu/reports](http://www.bio-based.eu/reports)

**DATA FOR 2019**

**Bio-based Building Blocks and Polymers – Global Capacities, Production and Trends 2019–2024**

Authors: Pia Skocinski, Raj Chirithapati, Michael Carus, Wolfgang Barth, Dore de Garmen, Harald Kieß, Achim Raschke, Jan Ravenstijn  
January 2020  
This and other reports on the bio- and CO<sub>2</sub>-based economy are available at [www.bio-based.eu/reports](http://www.bio-based.eu/reports)

**NEW**

**Levulinic acid – A versatile platform chemical for a variety of market applications**

Global market dynamics, demand/supply, trends and market potential

Authors: Achim Raschke, Pia Skocinski, Raj Chirithapati, Angel Plante and Michael Carus, nova-Institut GmbH, Germany  
October 2019  
This and other reports on the bio-based economy are available at [www.bio-based.eu/reports](http://www.bio-based.eu/reports)

**UPDATE 2019**

**Succinic acid – From a promising building block to a slow seller**

What will a realistic future market look like?

Pharmaceutical/Cosmetic	Industrial
<ul style="list-style-type: none"> <li>Active ingredient for denture cleaners/brushes</li> <li>Antibiotic</li> <li>Calcium succinate is anti-infective</li> <li>Chemical stabilizer</li> <li>Emulsifier for cosmetics</li> <li>Pharmaceutical of chemotherapy (antibiotic, anticancer)</li> <li>Preventive for cellulose</li> <li>Preventive for cellulose</li> <li>Preventive for cellulose</li> <li>Preventive for cellulose</li> <li>Used in the preparation of vitamin K</li> </ul>	<ul style="list-style-type: none"> <li>Di-ester</li> <li>Engineering plastics and epoxy curing hardeners</li> <li>Hydroxybutyrate</li> <li>Monomers, terpolymers, copolymers of polyesters</li> <li>Monomers for bio-based polyurethanes, polyurea</li> <li>Polymers</li> <li>Solvents, lubricants</li> <li>Sulfonic chelating agent (metal-structure, semiconductor industry)</li> </ul>
Food	Detergent
<ul style="list-style-type: none"> <li>Bread whitening agent</li> <li>Flavour enhancer</li> <li>Preserving agent and water binding in beverages</li> <li>Water-soluble emulsifier of foodstuffs</li> <li>Preventive for cellulose, etc. feed</li> <li>Preventive for cellulose, etc. feed</li> <li>Preventive for cellulose, etc. feed</li> <li>Preventive for cellulose, etc. feed</li> <li>Used in synthesis of modified starch</li> </ul>	<ul style="list-style-type: none"> <li>Sealing detergent</li> <li>Chemical metal plating, electroplating baths</li> <li>Chelating, also organic, preventing metal-catalyzed oxidizing, more for water-based paint</li> <li>As biodegradable, phosphorus-free, biocidal</li> <li>Preventive for cellulose, etc. feed</li> <li>Preventive for cellulose, etc. feed</li> <li>Preventive for cellulose, etc. feed</li> <li>Preventive for cellulose, etc. feed</li> <li>Used in synthesis of modified starch</li> </ul>

Authors: Raj Chirithapati, Angel Plante, Pia Skocinski, Achim Raschke, Michael Carus, nova-Institut GmbH, Germany  
October 2019  
This and other reports on the bio-based economy are available at [www.bio-based.eu/reports](http://www.bio-based.eu/reports)

# THE BEST MARKET REPORTS AVAILABLE Bio- and CO<sub>2</sub>-based Polymers & Building Blocks

**Carbon dioxide (CO<sub>2</sub>) as chemical feedstock for polymers – technologies, polymers, developers and producers**

Authors: Achim Raschke, Pia Skocinski, 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](http://www.bio-based.eu/reports)

**Standards and labels for bio-based products**

Authors: Lara Dammer, Michael Carus and Dr. Asta Pietschmann, nova-Institut GmbH, Germany  
May 2017  
This and other reports on the bio-based economy are available at [www.bio-based.eu/reports](http://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](http://www.bio-based.eu/reports)

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

Authors: Dirk Carus, Claver Consult, Belgium  
Jan Philip, OECD, France  
Dr. Harald Kieß, nanocoin 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](http://www.bio-based.eu/reports)

**Asian markets for bio-based chemical building blocks and polymers**

Author: Wolfgang Barth, Wobast Expedition Consultancy, Thailand  
This and other reports on the bio-based economy are available at [www.bio-based.eu/reports](http://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

Authors: Harald Kieß, nanocoin, InaB, Florence Anselmann, Lara Dammer, Michael Carus (nova-Institut)  
April 2016  
This and other reports on the bio-based economy are available at [www.bio-based.eu/reports](http://www.bio-based.eu/reports)

**Brand Views and Adoption of Bio-based Polymers**

Author: Dr. Harald Kieß, nanocoin Innovation Consulting, Germany  
January 2016  
This and other reports on the bio-based economy are available at [www.bio-based.eu/reports](http://www.bio-based.eu/reports)

**Wood-Plastic Composites (WPC) and Natural Fibre Composites (NFC)**

European and Global Markets 2012 and Future Trends in Automotive and Construction

Authors: Michael Carus, Dr. Asta Eiler, Lara Dammer, Dr. Hans Kottis, Lena Schöb, Roland Essel, Elke Brühlmeier, Martin Barth  
This and other reports on the bio-based economy are available at [www.bio-based.eu/reports](http://www.bio-based.eu/reports)





# International Conference on Bio-based Materials

Online Conference • 12–14 May 2020

## 1<sup>ST</sup> DAY OF CONFERENCE / 12 May 2020 (10-19h CET)

### CONFERENCE OPENING



**10:00** **Michael Carus**  
**nova-Institut**  
Opening and Introduction

### MARKETS & SUSTAINABLE CIRCULAR ECONOMY



**10:10** **Okko Ringena**  
**UPM**  
Next Generation Biochemicals  
– UPM's 550 Million Euro  
Biorefinery Investment



**11:40** **Mikael Lindström**  
**Research Institutes of  
Sweden (RISE)**  
Bio-based Material – Bridging  
the Valley of Death



**10:40** **Lars Börger**  
**Neste Germany**  
Partnership Approach to  
Increase Circularity  
for Renewable Material  
Solutions



**12:10** **Riikka Joukio**  
**Metsä Group**  
Industry Designed for Circular  
Economy



**11:10** **Michael Carus**  
**nova-Institut**  
Update and Feedback on  
Renewable Carbon Strategy

## 1<sup>ST</sup> DAY OF CONFERENCE / 12 May 2020 (10-19h CET)

### BIO-BASED BUILDING-BLOCKS – TECHNOLOGIES, APPLICATIONS, MARKETS



**12:40** **María Pin-Nó**  
**Cornelius Specialties**  
 Sustainable Production of  
 Pinene-derived Monomers



**14:10** **Marc Lankveld**  
**Corbion**  
 Corbion's Route to FDCA



**13:10** **Ed de Jong**  
**Avantium**  
 Humins, a Versatile Material for  
 Thermoset Materials



**14:40** **Doris De Guzman**  
**Tecnon OrbiChem**  
 Bio-Based Building Blocks:  
 2020 Commercialisation  
 Update



**13:40** **Saskia Beuck**  
**Covestro Deutschland**  
 Alternative Raw Materials at  
 Covestro – Pushing Boundaries

### LIGNIN UTILISATION – BREAKTHROUGH?



**15:10** **Antje Potthast**  
**University of Natural  
 Resources and Life  
 Sciences, BOKU**  
 Lignin Utilisation – Why is it still  
 such a Challenge?



**16:10** **Christopher Carrick**  
**RenCom**  
 Scaling up Production of  
 Lignin Biomaterials for  
 Polymer Applications using  
 Reactive Extrusion



**15:40** **Ludo Diels and  
 Karolien Vanbroeckhoven**  
**VITO**  
 Lignin, Strongly on the Move  
 to Valorisation



**16:40** **Stéphanie Baumberger**  
**AgroParisTech**  
 Use of Lignins as a Sustainable  
 Source of Antioxidants





1<sup>ST</sup> DAY OF CONFERENCE / 12 May 2020 (10-19h CET)

SIX INNOVATION AWARD PRESENTATIONS



**17:10** **Martin Lindmeyer**  
**Yncoris**  
New Name in Industrial Service  
and Current Projects Related to  
the Bioeconomy



**18:10** **Angela Invanova**  
**LAM'ON**  
LAM'ON



**17:25** **Michael Carus**  
**nova-Institut**  
Innovation Award Introduction



**18:25** **Michael Trinkaus**  
**Mondi Engineered Materials**  
Wiping Unsustainable Worries  
away: Mondi's new CAC Line  
to Produce Fully Biodegradable  
Nonwovens for Wipes



**17:40** **Sabine Amberg-Schwab**  
**Fraunhofer Institute for  
Silicate Research**  
bioORMOCER®



**18:40** **Sylvia Di Felice**  
**monta Klebebandwerk**  
monta biopack®



**17:55** **Harald Kuiper**  
**Huhtamaki Lurgan**  
Fresh



**18:55** **Gregorio Katz**  
**TENSAC S.H.**  
ESTEN 80

**19:10** **ONLINE VOTING**

**19:20** **ANNOUNCEMENT OF INNOVATION AWARD WINNER BY YNCORIS**

# TOMORROW'S PLASTIC IS ALREADY HERE

We can help you to become less dependent on Fossil resources. With renewable and recycled raw materials, we can create more sustainable polymers and chemicals.

Let's work together to create a healthier planet!







We have a unique opportunity to mitigate climate change – and we intend to use it.

We are committed to the UN Business Ambition for 1.5°C. And for us this commitment means actions.

We promote sustainable forestry practices, develop climate positive products and invest in emissions reduction and responsible production.

We lead the forest-based bioindustry into a sustainable, innovation-driven and exciting future beyond fossils.

[upm.com/biofore](https://upm.com/biofore) • [upmbiochemicals.com](https://upmbiochemicals.com)

# BIOECONOMY MEANS ACTION



**INSPIRED** by the limitless opportunities of bioeconomy

**DELIVERING** renewable and responsible solutions

**INNOVATING** for a future beyond fossils

**UPM BIOFORE**  
**BEYOND FOSSILS**

## 2<sup>ND</sup> DAY OF CONFERENCE / 13 May 2020 (10-18 CET)

### CONFERENCE OPENING



**10:00** **Michael Carus**  
**nova-Institut**  
Opening and Introduction

### BIOREFINERIES AND CHEMICAL RECYCLING – LATEST DEVELOPMENTS



**10:10** **Dhivya Puri**  
**Fiberight**  
Fiberight – Municipal Solid  
Waste Based Biorefinery



**11:40** **Jurjen Spekreijse**  
**BTG Biomass Technology  
Group**  
Pyrolysis oil as a Bio-based  
Solution to Phenolic Resins  
and Creosotes



**10:40** **Jack "Tato" Bigio**  
**UBQ Materials**  
Why Waste Waste? UBQ's  
Technology Converts  
Household Waste into a Bio-  
based, Recyclable, Sustainable  
Material



**12:10** **Dennis Chafiã**  
**G.I. Dynamics**  
Biomass and Waste to Value  
Products



**11:10** **Jonas Hartman**  
**Neste Engineering Solutions**  
Up-scaling and Engineering in  
Distillation of Bio-based  
Materials

2<sup>ND</sup> DAY OF CONFERENCE / 13 May 2020 (10-18 CET)

## BIO-BASED POLYMERS AND PLASTICS – TECHNOLOGIES, APPLICATIONS, MARKETS &amp; POLICY



**12:40** **Lara Dammer**  
**nova-Institut**  
European Plastic Strategy and  
Circular Economy



**14:40** **Jan Ravenstijn**  
**GO!PHA**  
Fast Growing PHA-Demand  
and New Capacities,  
but what about Legislation?



**13:10** **Raj Chinthapalli  
and Asta Partanen**  
**nova-Institut**  
Market and Trend Report  
on Bio- and CO<sub>2</sub>-based  
Polymers and Biocomposites



**15:10** **Lenka Mynarova**  
**NAFIGATE Corporation**  
Natural Polymer Hydal PHA –  
New Global Opportunities for  
Circular Bioeconomy Solution



**13:40** **Fabien Resweber**  
**Mitsubishi Chemical  
Corporation**  
Incorporating Renewable  
Carbon in a wide  
Thermoplastic Solutions Offer



**15:40** **René Saint-Loup**  
**Roquette**  
POLYSORB® – A Versatile  
Monomer for Improving  
Thermoplastics  
and Thermosetting Properties



**14:10** **Mounir Izallalen**  
**Eastman Chemical  
Company**  
Eastman Cellulose Esters  
Polymers in the Circular  
Bioeconomy



# International Conference on **Bio-based Materials** Online Conference • 12–14 May 2020

2<sup>ND</sup> DAY OF CONFERENCE / 13 May 2020 (10-18 CET)

## BIO-BASED POLYMERS AND PLASTICS – TECHNOLOGIES, APPLICATIONS, MARKETS & POLICY



**16:10** **Verena Koch**  
**Peter Greven**  
Carbon Footprint of  
Oleochemicals – How  
Allocation Methods and  
Boundary Settings Impact  
the Footprint



**17:10** **Clémentine Arnault**  
**Carbiolice**  
Carbiolice makes PLA Fully  
Compostable



**16:40** **Daniel Zehm**  
**Fraunhofer Institute for  
Applied Polymer Research  
IAP**  
FDCA-based Polymer Materials  
beyond PEF



**17:40** **Rafael Alonso**  
**AIMPLAS**  
Novel Bio-based Polymers and  
Biomolecules for Sustainable  
Packaging Developments

3<sup>RD</sup> DAY OF CONFERENCE / 14 May 2020 (10-13 CET)

## CONFERENCE OPENING



**10:00** **Dennis Herzberg**  
**CLIB**  
Opening and Introduction

## FINE CHEMICALS – PHARMA, COSMETICS, BODY CARE &amp; SPECIALITIES (IN COOPERATION WITH CLIB)

**Chairperson** **Dennis Herzberg**, CLIB



**10:10** **James Philp**  
**OECD**  
Synthetic Biology, the Hope  
and the Hype



**11:40** **Ulrich Schörken**  
**TH Köln**  
Biotechnological Conversion of  
Renewable Resources for  
Cosmetic Applications  
Targeting Biosurfactants and  
Bioactive Ingredients



**10:40** **Gerard Santiago**  
**Nostrum Biodiscovery**  
Computer-aided Enzyme  
Engineering



**11:10** **Jakob Köchermann**  
**DBFZ**  
Production of Furfural and  
Levulinic Acid in a Two-Stage  
Hydrothermal Conversion  
Process as Precursor for GVL



**12:10** **Kathrin Brandt**  
**Evonik**  
**Roland Breves**  
**Henkel**  
Glycolipids – Making you Smile



# ALWAYS AT YOUR SITE

Industrial plants are highly complex and demanding. Our strength and building them and providing assistance during operation. Any

## **Our services for the chemical & bio-based industry:**

- **Accompanying projects from early stage to full-scale commissioning**
- **Technology assessment & feasibility studies**
- **Engineering of production processes from pilot- over demo- to industrial**
- **Experience in operation of plants including utility supply and safety man**
- **Design, support & assessment of trials**
- **Techno-economic analysis (TEA)**

mehr unter [www.yncoris.com](http://www.yncoris.com)



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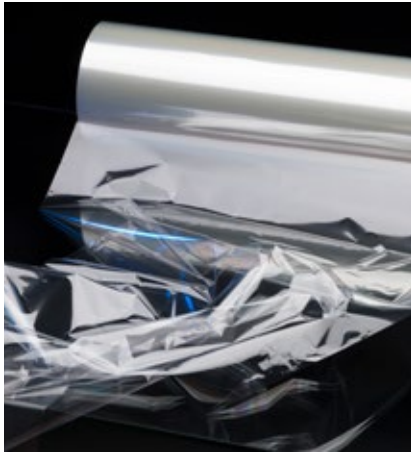
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**YNCORIS**  
Industrial Services



## Nominees for the Innovation Award Bio-based Material of the Year 2020



**Fraunhofer Institute for Silicate Research ISC (DE):**  
bioORMOCER® – functional barrier coatings



**Huhtamaki Lurgan (UK/FI):**  
Fresh – biodegradable ready meal packaging



**LAM'ON (BG):**  
LAM'ON – biodegradable laminating film



**Mondi Engineered Materials (AT):**  
biodegradable nonwovens for wipes



**monta Klebebandwerk (DE):**  
monta biopack® – self-adhesive tape



**TENSAC (AR):**  
ESTEN 80 – bio-based insecticide

Sponsor Innovation Award:



Organiser:





## What you can expect – the “Top 6” candidates in detail

**Fraunhofer Institute for Silicate Research ISC (DE):**  
bioORMOCER® – functional barrier coatings



Fraunhofer ISC has developed a functional barrier coating (ORMOCER®) that enables mono-material packaging, paper-based and compostable. With these coatings, the properties required for packaging food, cosmetics and pharmaceuticals can be achieved. The packaging can be easily recycled or composted. bioORMOCER® is bio-based and compostable and it uses bioorganic structures from green waste, or chitosan.

More information: [www.isc.fraunhofer.de](http://www.isc.fraunhofer.de)

**Huhtamaki Lurgan (UK/FI):**  
Fresh – biodegradable ready meal packaging



Fresh is a fully bio-based and biodegradable ready meal packaging. It is a fibre-based ready meal tray, which is functional as a black plastic alternative, but easier to recycle and certified for home composting. It is made from natural wood fibres which are sourced from FSC certified and renewable Nordic forests. Fresh has been developed in collaboration by Huhtamaki, Saladworks (UK), and Södra (SE) through a BBI JU funded Horizon 2020 project (Feb 2017 – July 2020). The tray is food-safe, both oven proof and microwavable, cooler to touch, maintains rigid when heated and natural aesthetically pleasing. Trays are produced in Northern Ireland by Huhtamaki Lurgan using bespoke machines which were developed by Huhtamaki engineers.

More information: [www.huhtamaki.com](http://www.huhtamaki.com)

## What you can expect – the “Top 6” candidates in detail

### LAM’ON (BG):

LAM’ON – biodegradable laminating film



LAM’ON is a 100% biodegradable laminating film for print and packaging. It is derived from renewable resources like corn. The glue layer that was developed specifically for the needs of the industry is completely toxic-free. It is also water soluble and that will ease the recycling process. The production method is simplified in a way that saves time and money. LAM’ON offers the same results, is used on the same machines, and is offered at the same price range as the currently used laminating films.

More information: [www.lam-on.com](http://www.lam-on.com)

### Mondi Engineered Materials (AT):

biodegradable nonwovens for wipes



Mondi’s new Carded Airlaid Carded (CAC) line allows producing a fully biodegradable nonwoven for wipes. The new technology uses 100% cellulose content resulting in a nonwoven material that behaves like a classical spun lace. The CAC line makes it possible to combine three layers into a highly functional and stable composite material in-line. It improves the sustainability of non-wovens by using pulp that is a less energy intensive raw material than viscose but still achieves the properties of a 100% viscose-based material (e.g. soft and efficient cleaning). The new CAC line will be operational in beginning of 2021.

More information: [www.mondigroup.com](http://www.mondigroup.com)

## What you can expect – the “Top 6” candidates in detail

### **monta Klebbandwerk (DE):**

monta biopack® – self-adhesive tape



monta biopack® is the first certified sustainable self-adhesive tape made in Germany. Made from about 90% renewable resources, its carrier is a bio-based PLA film that is coated with a natural rubber adhesive. Under industrial composting conditions, this packaging tape biodegrades within a few months. monta biopack® meets the requirements on disintegration (composting), biodegradation, ecotoxicity and material characteristics of EN 13432, ASTM D 6400-04, AS 4736 (2006) and ISO 17088 (2012): Certified by TÜV Austria and awarded with the “OK COMPOST INDUSTRIAL” conformity mark, monta biopack® is the eco-friendly choice for sealing cardboard boxes, biodegradable bags and for bundling flowers and garden waste. Its sustainable roll length of 80 m and 1,200 m reduces unnecessary packaging waste.

More information: [www.monta.de](http://www.monta.de)

### **TENSAC (AR):**

ESTEN 80 – bio-based insecticide



ESTEN 80 is a bio-based insecticide and acaricide which is natural, works in direct contact with the insects and obtained from a process where the main ingredients are fatty acids derived from vegetable oils and sucrose. The conferred properties of being completely biodegradable make it especially suited for Integral Pest Management (I.M.P). It does not only act as an insecticide/acaricide, but also as an adjuvant significantly improving its adhesion to the application crops. ESTEN 80 is especially indicated for application in citrus (e.g. lemon, orange), grape, tomato, horticultural crops, strawberry, blueberry, apple, pear, peach, tobacco, tea, olives and walnuts. ESTEN 80 adheres to the insect, forming a film that acts on the protective layer and dissolves them.

More information: [www.tensac.com.ar](http://www.tensac.com.ar)



Look forward to the next  
**CLIB International Conference**  
on 4 & 5 February 2021



**Be part of it!**



networking biotechnology  
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- |                              |             |
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| ● CCUS                       | Coming soon |
| ● Greener Plastics           | since 2020  |

BT2i, Business & Technology Intelligence for Innovation, has over 35 years experience of in producing added value services in Techno Scouting, Technology Intelligence, Technology marketing and International Technology Transfers.

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FOR INNOVATION

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## TWatch

MULTI-CLIENT  
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INTELLIGENCE

## GREENER PLASTICS

### Watch Territory

- Bioplastics
- Biocomposites
- Natural fibres
- Non-toxic plastics and substitution of chemicals
- CO2 based polymers
- Recycled plastics
- "Plastic-free" materials
- Case studies
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# 13<sup>th</sup>

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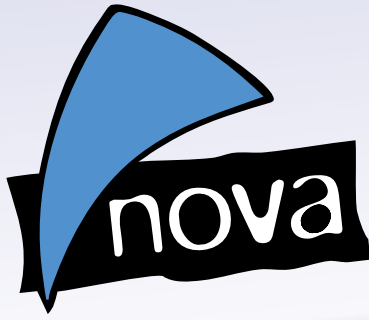
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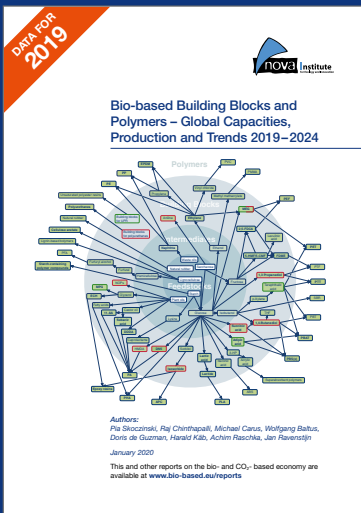
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