CELLULOSE FIBRES CONFERENCE 2024

Cologne (Germany) 13–14 March

Conference Journal

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Free WiFi

Network ID nova-Conference
Password #2024CFC

#2024CFC

LinkedIn #2024CFC

12 March 2024, 19:00 (CET)
On the eve of the conference

Proposed Meeting Point for a Social Evening Gathering

Kölsch Brewery
Schreckenskammer
Ursulagartenstraße 11–15, 50668 Köln (Cologne)
(10 minutes walk from Cologne Central Station)

Join at sli.do
for real time questions and comments

All Sessions
Grand Hall

#2024CFC

Zoom Events
We sent you the link to Zoom Events.

All details:
Please see page 10.

Program

The Cellulose Fibre Conference is packed with a variety of relevant topics, divided into nine sessions.

You can look forward to the following contents:

DAY 1

13 March 2024
9:30–18:00 (CET)

P. 14

Session 1:
Traditional and New Markets for Cellulose Fibres

Session 2:
Cellulose Fibres at the Forefront of the Race to Replace Single-Use Plastic Products

Session 3:
Sustainability and Environmental Impacts

Session 4:
Innovation Award "Cellulose Fibre Innovation of the Year 2024"

DAY 2

14 March 2024
9:00–16:40 (CET)

P. 28

Session 1:
Circular Economy and Recyclability of Fibres

Session 2:
Alternative Feedstocks and Supply Chains

Session 3:
Cellulose Fibre based Hygiene Products

Session 4:
Ionic Liquids and New Technologies for Pulps, Fibres and Yarns (Part 1)

Session 5:
Ionic Liquids and New Technologies for Pulps, Fibres and Yarns (Part 2)

Welcome to the **Cellulose Fibres Conference 2024**

Dear Participants of the Conference and Exhibition,

Welcome to the world's only conference dedicated exclusively to cellulose fibres – in textiles, hygiene products and packaging. Together with our sponsors and partners, we are delighted that a large number of relevant players and innovators are present in Cologne and ready for the fifth conference in a row. This will be celebrated at the conference dinner on the first day.

Learn and discuss the latest market data, technologies and policies that expand the application possibilities of cellulose fibres. A very important topic of the conference is sustainability, and cellulose fibres have a lot to offer in this respect. They have a low environmental footprint, leave no microparticles and are made from 100 % renewable carbon.

The global MMCF production volume has more than doubled from around 3 million tonnes in 1990 to approximately 7.2 million tonnes in 2021, and is expected to further grow in the coming years. Cellulose fibres have an increasingly wide range of applications. At the same time markets are driven by technological developments and political framework conditions, especially bans and restrictions on plastics and increasing sustainability requirements for textiles.

The European Commission has prioritised the transition to sustainability and the circular economy for various industries, in particular the textile sector. Cellulose fibres offer important solutions for the future and are already available today in large and growing quantities. Alternative, recycled sources of cellulose further improve sustainability.

As every year nova-Institute grants the "Cellulose Fibre Innovation of the Year" award at the "Cellulose Fibres Conference". In advance, the conferences advisory board nominated six remarkable products, including cellulose fibres from textile waste and straw, a novel technology for dying cellulose-based textiles and a construction panel as well as geotextiles. The innovations will be presented by the companies on the first day of the event. All conference participants can vote for one of the six nominees, and the "top three" winners will be honoured with the "Cellulose Fibre Innovation of the Year" award.

Be curious! We wish you a lively exchange, lots of inspiration and extensive networking.
And have fun in the lively city of Cologne.

Yours sincerely

Michael Carus
Managing Director

Asta Partanen
Content Manager of the Conference

Your Conference Team

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Brigitte Hellwig
Representative of the nova-Institute at Booth No. 6
brigitte.hellwig@nova-institut.de

Registration

cellulose-fibres.eu/registration

Venue & Accommodation

Maternushaus
Kardinal-Frings-Str. 1–3
50668 Köln (Cologne)
Germany

Phone: +49 221 – 1631-0
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www.cellulose-fibres.eu/venue

Entrance Fee

2 Days • 13–14 March 2024
Ticket for on site (and online) attendance
incl. dinner buffet on the first day
995 €

Day 1 • 13 March 2024
Ticket for on site (and online) attendance
incl. dinner buffet
670 €

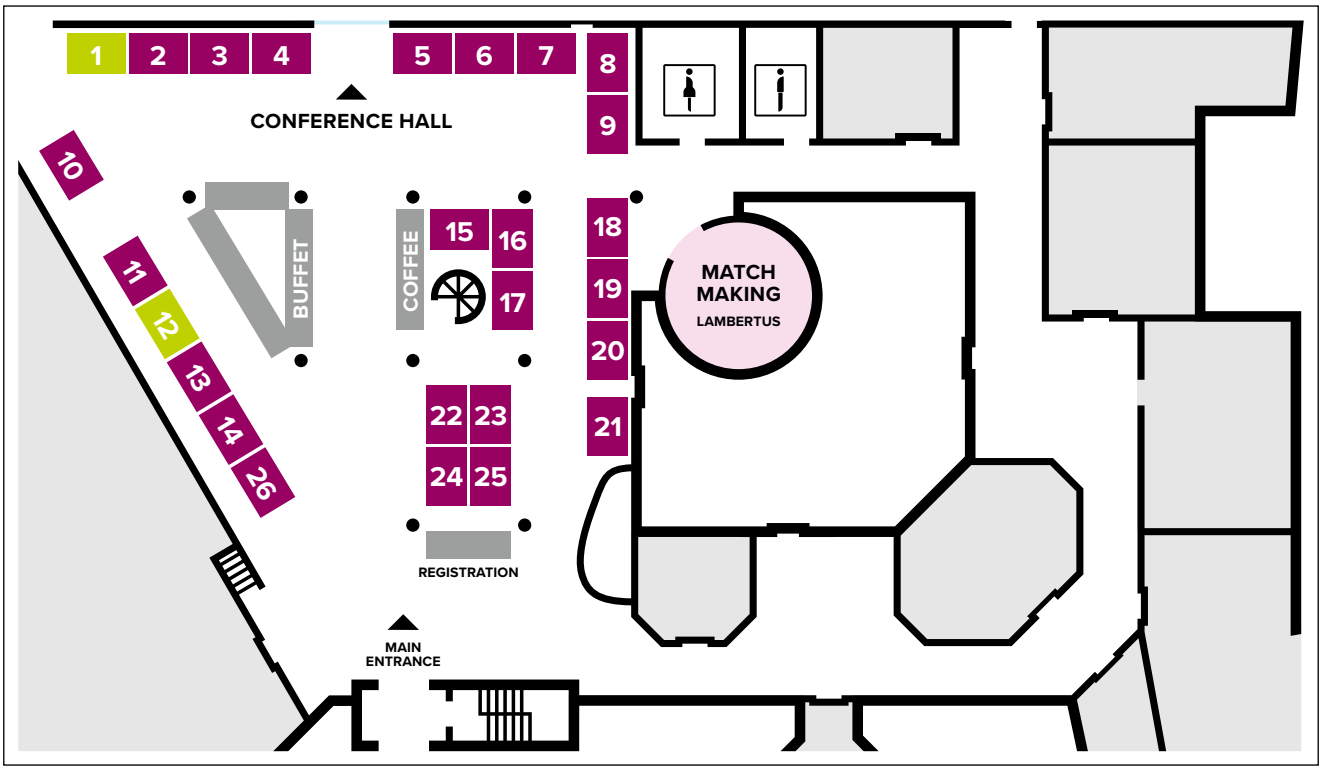
Day 2 • 14 March 2024
Ticket for on site (and online) attendance
600 €

2 Days Online Ticket • 13–14 March 2024
Ticket for virtual attendance
690 €

2 Days Student Ticket • 13–14 March 2024
Ticket for on site (and online) attendance
incl. dinner buffet on the first day
350 €

Exhibition

Free Reserved for Sponsors Booked



List of Exhibitors

02 Kemira (FI)
03 ANDRITZ (AT)
04 GIG Karasek (AT)
05 LIST Technology (CH)
06 nova-Institute (DE)
07 Lenzing (AT)
08 Media Table
09 Kelheim Fibres (DE)
10 Himson (IN)
11 VAM AGRO (UA)
13 TreeToTextile (SE)
14 Textechno Herbert Stein (DE)
15 Dienes (DE)
16 Birla Purocel (IN)
17, 19 & 20 Poster Session
18 Matchmaking
21 Valvan (BE)
22 BPC Instruments (SE)
23 Innovation Award “Cellulose Fibre Innovation of the Year 2024”
24 Vecoplan (DE)
25 Institut für Textiltechnik of RWTH Aachen University (ITA) (DE)
26 ReMade@ARI (EU-Project)

book your booth soon

Book your booth: cellulose-fibres.eu/exhibition-booking

Status:
12 March 2024
More exhibitors expected: cellulose-fibres.eu/exhibitors

Poster Session

The poster session will take place during the lunch break (12:50 – 14:30, CET) of the second day 14 March with a few minutes presentation at a special poster area at booths number 17, 19 and 20 on the exhibition space. We have a record number of posters this year.

Aalto University – North Carolina State University (FI/US), Erfan Kimaei
Smart Assembly of Wood Polymers for Advanced Materials

Abu Dhabi Vocational Education and Training Institute (AE), Maria Mushtaq
Biocellulose production from Acetobacter isolated from Local Dates of UAE

Changwon National University (KR), Jung-il Song
Green and Scalable Extraction of High-Quality Cellulose Nanofibers from Imperata Cylindrica for High-Performance Green Composites

ESRF – The European Synchrotron (FR), Gary Admans
ReMade@ARI – Advanced materials characterisation for the European circular economy

Institut für Textiltechnik der RWTH Aachen University (DE), Amanda Kulessa
DuroBast: Harnessing Durability and Resource Efficiency through Advanced Bast Fiber Treatment

Intexter Universitat Politecnica de Catalunya – (UPC) (ES), Marta Riba-Moliner
Advancements in Sustainable Natural Dyes for Textile Applications

Intexter Universitat Politecnica de Catalunya (UPC) (ES), Gabriela Mijas
New Technologies for Pulps, Fibres and Yarns

Istanbul Technical University – Textile Technologies and Design Faculty (TR), Alper Güraslan
Silver Nanowire Coated Poplar Fiber Based Nonwovens

KTH Royal Institute of Technology (SE), Antonia von Schreeb
Chemical Reactivity of very Swollen Cellulose

Mohammed VI Polytechnic University (MA), Naji Majoudi
Investigating Hydrophobic Modification of Cellulose Paper: Thermochemical Modification and Structural Insights

NC State University (US), Nelson Barrios
Decarbonizing the Energy-Intensive Drying of Cellulosics: Exploring Bound-Water Removal through Computer Simulations

Niederrhein University of Applied Sciences (DE), Leon Blanckart
Natural Aquatic Fiber: Exploiting Algae as new raw Material for Textile

NOVA School of Science and Technology, Universidade NOVA de Lisboa (PT), A. Nascimento, Rosa E.
Optimization of Cellulose Recovery from Banana Plant Pseudostem using Pre-Treatments

RISE – Research Institutes of Sweden (SE), Cláudia Vicente Esteves
Yield Improvement of Kraft Fibers by Oxygen Delignification Using Rejects from Kraft Cooking

Teagasc Food Research Centre (IE), Akhila Vijayakumar
Cellulose Recovery from Waste Streams after Leaf Protein Extraction

Technical University of Denmark (DK), Divya Dharshini Uma Shankar
Sea to Cellulose: Harnessing Ocean Water for Sustainable Cellulose Biomanufacturing

Universitat Politècnica de Catalunya – BarcelonaTech (UPC), Elisabet Quintana
Recovering Cellulose Fibres from Discarded Textile Wastes

Universita Politecnica delle Marche (IT), Rida Jbr
Valorization of Recovered Micro-crystalline Cellulose and Polyester Fibers from Textile Waste Streams

University of Leeds (UK), Olivia Skilbeck
The Effect of Preparation, Dyeing and Finishing Treatments on the Biodegradation of Cellulose Microfibres

cellulose-fibres.eu/posters

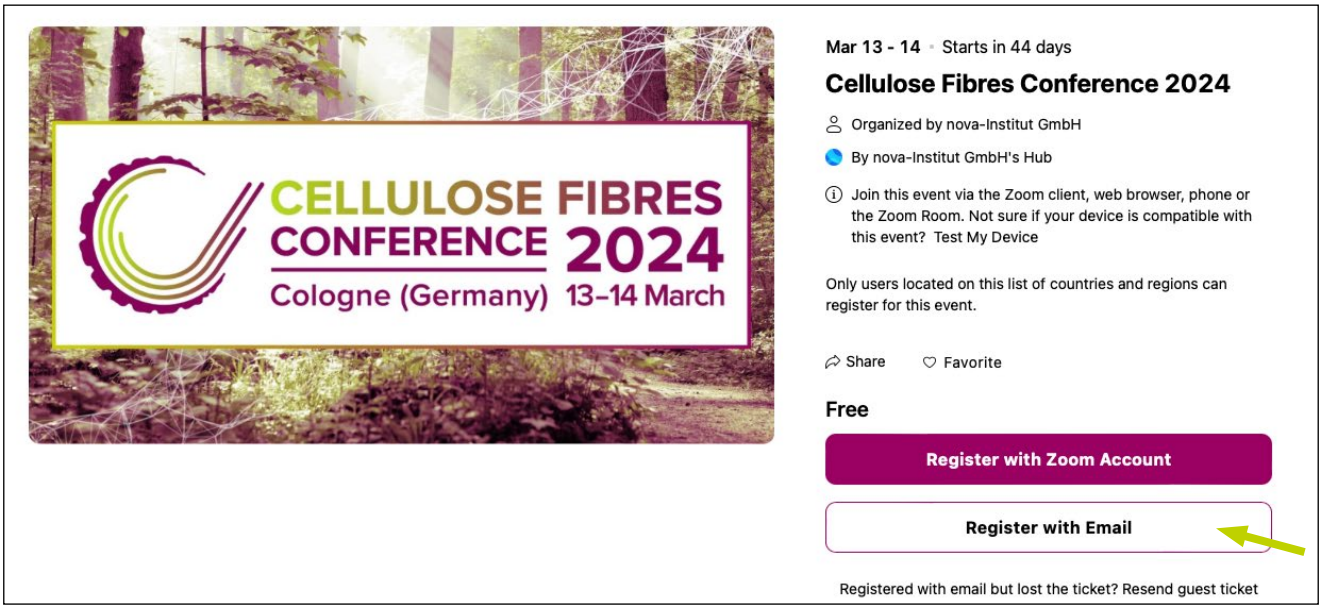
Networking and Streaming Platform

Zoom Events offers all participants, speakers, exhibitors and sponsors the opportunity to network and chat.

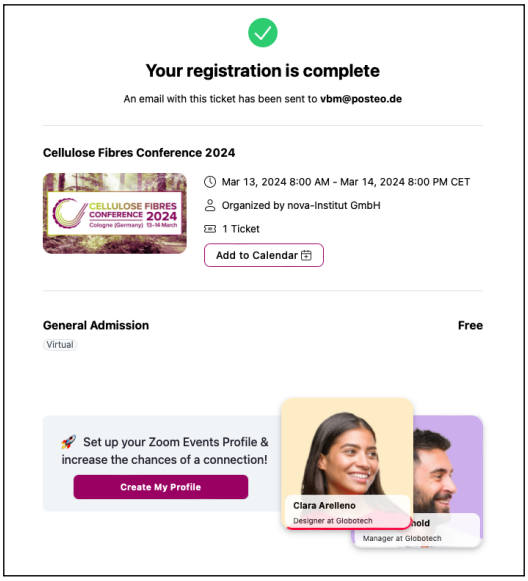
How to enter

1 The use does not require a Zoom account. You can also register with a valid email address.

Use the link in your participation confirmation email to register to the Zoom Events platform.
There, you can get in contact with other participants, speakers, exhibitors and sponsors.

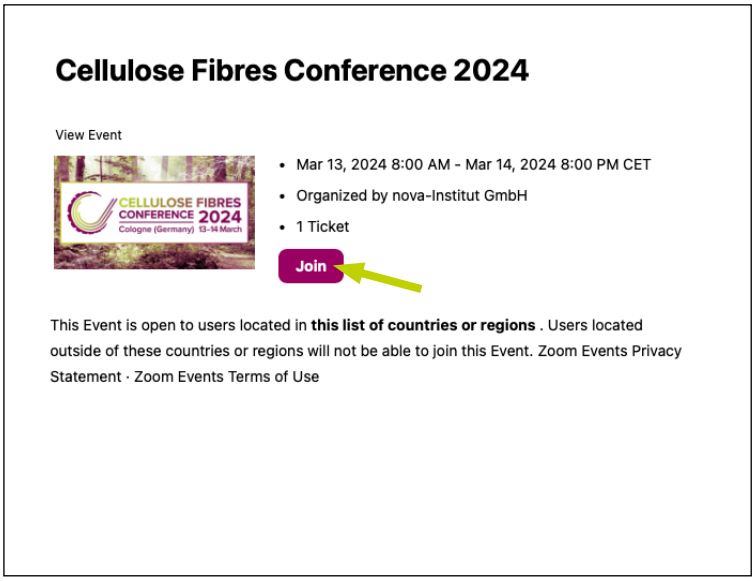


2 If you have a Zoom account, please use it to login. Otherwise please login with your email account, a verification code will be sent to you via email.



3 After registration, you will then receive a second email which contains a “Join” button.

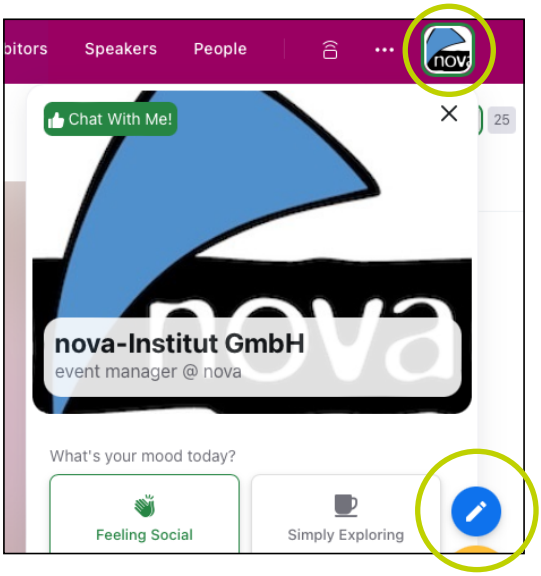
Please use this path to (re)enter throughout all conference days.



Your profile

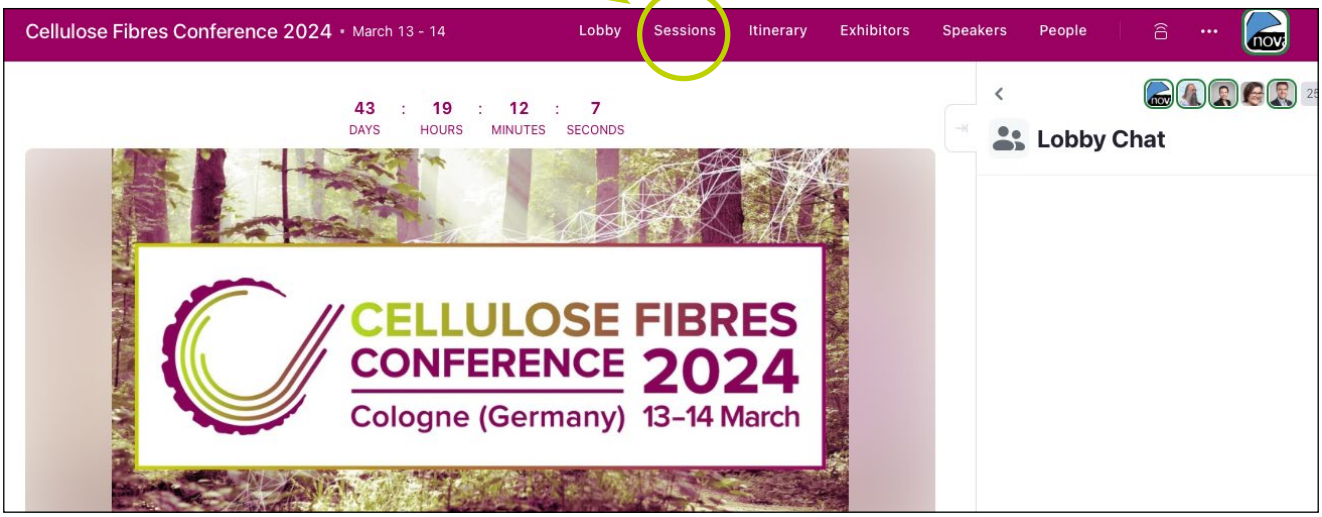
Adding more information allows others to find and contact you, by entering for example key words.

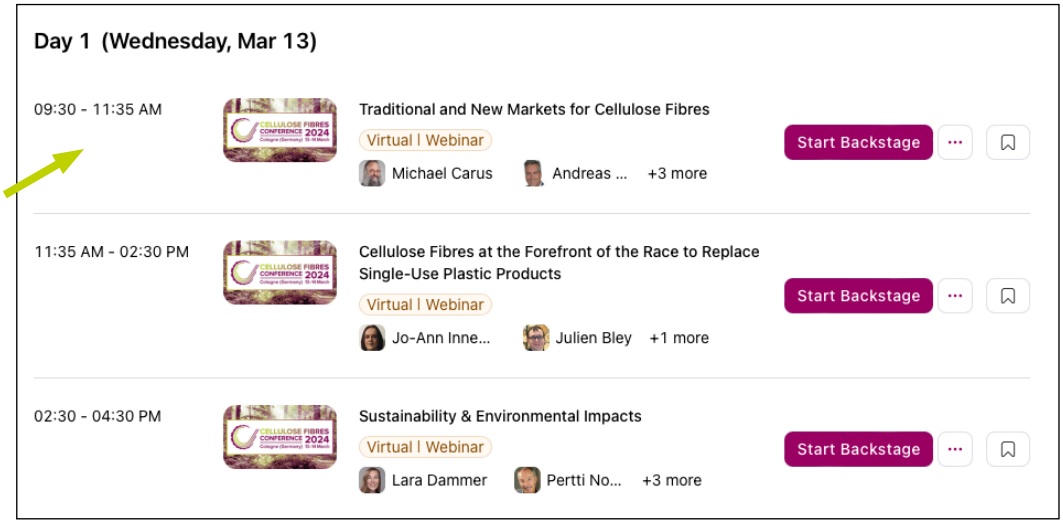
To edit your profile, click on the icon in the upper right corner.



How to follow the livestream

Sessions in the main event hall will be streamed in the lobby, but you can have a larger screen by clicking on “sessions” and entering the individual session.





Sustainable Textiles – a Long Way to Go

High dependence on fossil carbon, associated high carbon footprint, low recycling rates and microplastics: several solutions are emerging

Michael Carus and Dr. Asta Partanen,
nova-Institute (Germany)

The evolution of the demand for textile fibres from 1960 to the present day (see Table 1) shows how the textile industry found itself in this dilemma. In 1960, around 95% of textile fibres were of natural origin, from bio-based carbon, and there was no problem with microplastics, all fibres were biodegradable. The explosion in demand – 460% between 1960 and 2020 – could only be met by synthetic fibres from the chemical and plastics industries. Their share grew from 3% in 1960 to 66% in 2020 and from less than 700 tonnes to 57 million tonnes/year[1].

The new fibres covered a wide range of properties, could even achieve previously unknown properties and, above all, thanks to a powerful and innovative chemical and plastics industry, production volumes could be rapidly increased and comparatively low prices realised.

At the same time, sustainability has declined, the carbon footprint of the textiles has increased significantly and the issue of microplastics requires solutions.

Global major fibre types by production in %

	Cotton	Bast Fibre	Wool	Cellulosics	Synthetics	Others	Total in Mio. tonnes	kg/head
2030 forecast	19	3	1	8	69	1	143	16.8
2020	23	3	1	6	66	1	113	14.6
2010	28	5	1	5	59	1	80	11.6
2000	34	6	2	5	51	2	56	9.1
1990	40	9	5	7	37	2	43	8.2
1980	40	12	4	10	31	3	35	7.9
1970	43	14	6	14	18	5	26	7.2
1960	50	21	7	13	3	5	20	6.6

Source: The Fiber Year 2023, editor: The Fiber Year Consulting

The first step would be to significantly increase the proportion of renewable fibres, as this is the only way to reduce dependence on fossil carbon, especially in the form of crude oil, and thus reduce the carbon footprint. But how can this be done? As defined by the Renewable Carbon Initiative, renewable carbon comes from biomass, CO_2 and recycling: From carbon above ground. This addresses the core problem of climate change, which is extracting and using additional fossil carbon from the ground that will end up in the atmosphere.

What can cotton and bast fibres contribute?

Cotton fibre production can hardly be increased, it is stagnating between 25 and max. 27 million tonnes/year. Cultivated areas can hardly be expanded, and existing areas are salinised by the irrigation required. With the exception of about 1% organic cotton, significant amounts of pesticides are used. The market share of "preferred" cotton – defined by a list of recognised programmes – will fall from 27% of total cotton production in 2019/20 to 24% in 2020/21, after years of growth[2].

Bast fibres such as jute (75%), flax, hemp, ramie or kenaf would require a huge boost in technology development and capacity investment and will nevertheless probably remain more expensive than cotton, simply because bast fibres are much more complicated to process, e.g. separating the fibre from the stalk, which is not necessary for cotton as a fruit fibre. As a source of cellulose fibre, bast fibres will remain more expensive than wood.

Although bast fibres are more sustainable than many other fibres, there is unlikely to be a major change – unless China focuses on bast fibres as a substitute for cotton. Plans to do so have been put on hold due to technological problems.

The importance of man-made cellulosic fibres (MMCFs) or simply cellulose fibres

Cellulose fibre production has been growing steadily over the last decades, reaching an all-time high of more than 7 million tonnes in 2020, and is expected to grow further to 11 million tonnes in 2030. **Cellulosic fibres are the only bio-based and biodegradable fibres that cover a wider range of properties and applications and can rapidly increase their capacity.** The raw materials can be virgin wood as well as all types of cellulosic waste streams from forestry, agriculture, cotton processing waste, textile waste and paper waste. **Increasing the share of cellulosic fibres will therefore play a crucial role in solving the sustainability challenges of the textile industry.**

The production of MMCFs includes viscose, lyocell, modal, acetate and cupro. The market share of FSC and/or PEFC certified MMCF increased from 55-60% in 2020 to 60-65% of all MMCF in 2021. The market share of "recycled MMCFs" increased to an estimated share of 0.5%. Much research and development is underway. As a result, the volumes of recycled MMCFs are expected to increase significantly in the coming years. (Textile Exchange, October 2022: Preferred Fiber & Materials Market Report)

To get the latest information on cellulose fibres, the nova-Institute organises the "Cellulose Fibres Conference" every year, which will take place next time in Cologne on 13 and 14 March 2024 (www.cellulose-fibres.eu).

Bio-based and CO_2-based synthetic fibres

To further reduce the share of fossil-based synthetic fibres, bio-based polymer fibres are an excellent option because of their wide range of properties – only the implementation will take decades as the share today is only below 0.5%. There are many options, such as polyester fibres (PLA, PTT, PEF, PHA), polyolefin fibres (PE/PP), bio-based PA fibres from castor oil. PTT, for example, is well established in the US carpet market and PLA in the hygiene market. They are all bio-based, but only a few are also biodegradable.

In principle, many fibres can also be made from CO_2, but here the technology and capacity needs to be developed, perhaps in parallel with the production of sustainable aviation fuels from CO_2, which will become mandatory.

Circular economy – recycling of textile waste

The recycling of textiles could reduce the demand for virgin fibres and reduce the textile footprint. The share of recycled fibres increased slightly from 8.4% in 2020 to 8.9% in 2021, mainly due to an increase in bottle-based PET fibres. However, in 2021, less than 1% of the global fibre market will come from pre- and post-consumer recycled textiles (Textile Exchange, October 2022: Preferred Fiber & Materials Market Report).

New regulations from Brussels for closed-loop recycling, especially bottle-to-bottle recycling, could threaten the use of bottle-based PET fibres in the textile industry. This would mean a reduction in recycling rates in the textile industry until the logistics and technologies are in place to recycle textiles on a large scale. This will be necessary to contribute to the circular economy. Several research projects are underway to find solutions and first pilot implementations are available.

The sustainable textile industry of the future will be based on a foundation of cotton fibres and fast-growing cellulose fibres, later strongly supported by bio- and CO_2-based synthetic fibres, and high recycling rates for all types of fibres. This combination can eventually replace most fossil-based synthetic fibres.

1 The Fiber Year 2023, editor: The Fiber Year Consulting
2 Textile Exchange, October 2022: Preferred Fiber & Materials Market Report

DAY 1
13 March 2024, 9:30–18:00 (CET)

9:30 **Michael Carus**
nova-Institute (DE)
Conference Opening

9:40 – 11:15

Traditional and New Markets for Cellulose Fibres

Grand Hall

Chairpersons: Asta Partanen & Michael Carus, nova-Institute

9:40

Andreas Engelhardt
The Fiber Year (CH)
Latest Market Trends in the Textile Industry

10:00

Łucja Wanicka
AFRY Management Consulting (FI)
Man-made Cellulosic Fibre Value Chains in Transition

10:20

Sascha Schriever & Rosario Othen
Institut für Textiltechnik RWTH Aachen (DE)
Cellulose Fibers – a Versatile raw Material for Textile and Paper Industry

10:40

Jukka Kantola
World BioEconomy Forum (FI)
Evolving Cellulosic Textile Fibres – Case Finland

11:00
Panel Discussion with all Session Speakers

11:15
Coffee Break & Networking

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11:45 – 13:20

Cellulose Fibres at the Forefront of the Race to Replace Single-Use Plastic Products

Grand Hall

Chairpersons: Michael Carus & Lara Dammer, nova-Institute

11:45

Jo-Ann Innerlohinger
Lenzing (AT)
Microfibres, Biodegradation and Learnings from SUPD

12:05

Julien Bley
Innofibre (CA)
Cellulosic Foam for Packaging and Insulation Products

12:25

Miriam Weber
Hydra Marine Sciences (DE)
The Potential of Biodegradable Cellulose Fibres in the Environment and how to Evaluate it

12:45

Rahul Bansal
Birla Purocel (IN)
The Evolution of Biodegradable Compostable Wipes and Absorbent Hygiene Products: Status and Future Directions

13:05

Panel Discussion with all Session Speakers

13:20
Lunch Break & Networking

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Certified Biodegradable & Compostable by TUV AB

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14:20 – 15:55

Sustainability and Environmental Impacts

Grand Hall

Chairpersons: Lara Dammer & Matthias Stratmann, nova-Institute

14:20

Lara Dammer
nova-Institute (DE)
EU Green Claims Directive – What does it mean for the Industry?

14:40

Pertti Nousiainen
Nousfiber Consulting (FI)
Sustainability in Processing of man-made Cellulose Fibres for Various End-uses

15:00

Erfan Kimiaei
North Carolina State University & Aalto University (US/FI)
A Smart Combination of Nanocellulose with a Biodegradable Polyester: Interfacial Design, Application, and End-life in Aquatic Environments

15:20

Mika Plum & Matthias Stratmann
nova-Institute (DE)
Cellulose Fibres in LCA – The Status Quo

15:40

Panel Discussion with all Session Speakers

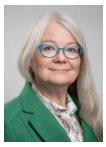
15:55
Coffee Break & Networking

16:30 – 18:00

Innovation Award "Cellulose Fibre Innovation of the Year 2024"

Grand Hall

16:30

Michael Carus & Asta Partanen
nova-Institute (DE)
Introduction for the Cellulose Fibre Innovation of the Year 2024

16:40

Wolfgang Aichhorn
Gig Karassek (AT)
New MVR Solvent Recovery Solution, an Innovative Approach Towards a Green Future

16:50

Marc Philip Vocht
DITF & VRETENA (DE)
The Straw Flexi-Dress: Design Meets Sustainability

17:00

Pol Merino
Honext Material (ES)
HONEXT® Board FR-B (B-s1, d0) – Flame-retardant Board made From Upcycled Fibre Waste From the Paper Industry

17:10

Berndt Köll
Lenzing (AT)
LENZING™ Cellulosic Fibres for Glacier Protection

17:20


Chelsea Franklin & Christo Stanev
Pangaia (UK) & Evrnu (US)
The RENU Jacket – Advanced Recycling for Cellulosic Textiles

17:30

Marianna Vehviläinen
Technical Research Centre of Finland VTT (FI)
Textiles Made from Easy-to-dye Biocelsol

17:40

Maria Gunnarsson
TreeToTextile (SE)
A New Generation of Bio-based and Resource-efficient Fibre

17:50

Online Voting and Announcement of the Winners

18:00

Networking with Local Beer

20:00
Gala Dinner

AWARD SPONSOR

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A Member of Dr. Aichhorn Group

Green Solvent Recovery Solution

MVR solution patented by GIG Karasek

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- Reduced use of cooling water
- Small plant footprint

Let's team up for a sustainable circular economy!

Innovation Award “Cellulose Fibre Innovation of the Year 2024”

Six award nominees will present promising sustainable solutions for the industry in the field of cellulose fibres value chains. The full innovation potential of the cellulose fibre industry will be displayed to a wide audience in Cologne (Germany), and online.

For the fourth time, nova-Institute awards the “Cellulose Fibre Innovation of the Year” award in the frame of the “Cellulose Fibres Conference 2024” (13–14 March 2024).

The conference advisory board nominates six remarkable products and the nominees have the opportunity to present their innovation to a broad expert audience on the first day of the conference. After voting for the winner, the award ceremony will take place in the evening.

Cellulose fibres show a steadily expanding range of applications. At the same time, markets are driven by technological developments and political framework conditions, especially bans and restrictions on plastics and increasing sustainability requirements for textiles.

The European Commission has made the thorough transition towards sustainability and circularity for different industries and especially the textile sector a main focus. All nominees will therefore introduce innovative pathways towards more sustainable technologies and products.

Conference Advisory Board

We would like to thank the experts of the conference advisory board for their great help in selecting the best submitted papers and innovations.

Rahul Bansal
Birla Cellulose (IN)

Jo-Ann Innerlohinger
Lenzing (AT)

Roland Seidl
Textilplus (CH)

Marina Crnoja-Cosic
Kelheim Fibres (DE)

Ralf Nyhofen
Bozzetto Group (IT/DE)

Michael Trinkaus
Nitto Advanced Film Solutions (DE)

Andreas Engelhardt
The Fiber Year (CH)

Antje Potthast
University of Natural Resources and Life Sciences (AT)

Ali Harlin
VTT (FI)

Sascha Schriever
ITA - RWTH Aachen (DE)

Nominees of the Innovation Award

Organiser

Award Sponsor

Innovation Award

1

The Straw Flexi-Dress: Design Meets Sustainability

DITF & VRETENA (DE)

The Flexi-Dress design was inspired by the natural golden colour and silky touch of HighPerCell® (HPC) filaments based on unbleached straw pulp. These cellulose filaments are produced using environmentally friendly spinning technology in a closed-loop production process. The design decisions focused on the emotional connection and attachment to the HPC material to create a local and circular fashion product. The Flexi-Dress is designed as a versatile knitted garment – from work to street – that can be worn as a dress, but can also be split into two pieces – used separately as a top and a straight skirt. The top can also be worn with the V-neck front or back. The HPC textile knit structure was considered important for comfort and emotional properties.

More information: www.ditf.de
www.vretena.de

2

HONEXT® Board FR-B (B-s1, d0) – Flame-retardant Board Made from Upcycled Fibre Waste

Honext Material (ES)

HONEXT® FR-B board (B-s1, d0) is a flame-retardant board made from 100 % upcycled industrial waste fibres from the paper industry. Thanks to innovations in biotechnology, paper sludge is upcycled – the previously "worthless" residue from paper making – to create a fully recyclable material, all without the use of resins. This lightweight and easy-to-handle board boasts high mechanical performance and stability, along with low thermal conductivity, making it perfect for various applications in all interior environments where fire safety is a priority. The material is non-toxic, with no added VOCs, ensuring safety for both people and the planet. A sustainable and healthy material for the built environment, it achieves Cradle-to-Cradle Certified GOLD, and Material Health Certificate™ Gold Level version 4.0 with a carbon-negative footprint. Additionally, it is verified in the Product Environmental Footprint.

More information: www.honextmaterial.com

3

LENZING™ Cellulosic Fibres for Glacier Protection

Lenzing (AT)

Glaciers are now facing an unprecedented threat from global warming. Synthetic fibre-based geotextiles, while effective in slowing down glacier melt, create a new environmental challenge: microplastics contaminating glacial environments. The use of such materials contradicts the very purpose of glacier protection, as it exacerbates an already critical environmental problem. Recognizing this problem, the innovative use of cellulosic LENZING™ fibres presents a pioneering solution. The Institute of Ecology, at the University of Innsbruck, together with Lenzing and other partners made first trials in 2022 by covering small test fields with LENZING™ fibre-based geotextiles. The results were promising, confirming the effectiveness of this approach in slowing glacier melt without leaving behind microplastic.

More information: www.lenzing.com

4

The RENU Jacket – Advanced Recycling for Cellulosic Textiles

Pangaia (UK) & Evrnu (US)

PANGAIA LAB was born out of a dream to reduce barriers between people and the breakthrough innovations in material science. In 2023, PANGAIA LAB launched the RENU Jacket, a limited edition product made from 100 % Nucycl® – a technology that recycles cellulosic textiles by breaking them down to their molecular building blocks, and reforming them into new fibres. This process produces a result that is 100 % recycled and 100 % recyclable when returned to the correct waste stream – maintaining the strength of the fibre so it doesn't need to be blended with virgin material.
Through collaboration with Evrnu, the PANGAIA team created the world's first 100 % chemically recycled denim jacket, replacing a material traditionally made from 100 % virgin cotton. By incorporating Nucycl® into this iconic fabric construction, dyed with natural indigo, the teams have demonstrated that it's possible to replace ubiquitous materials with this innovation.

More information: www.pangaia.com
www.evrnu.com

5

Textiles Made from Easy-to-dye Biocelsol

Technical Research Centre of Finland VTT (FI)

One third of the textile industry's wastewater is generated in dyeing and one fifth in finishing. But the use of chemically modified Biocelsol fibres reduces waste water. The knitted fabric is made from viscose and Biocelsol fibres and is only dyed after knitting. This gives the Biocelsol fibres a darker shade, using the same amount of dye and no salt in dyeing process. In addition, an interesting visual effect can be achieved. Moreover, less dye is needed for the darker colour tone in the finished textile and the possibility to use the salt-free dyeing is more environmentally friendly. These special properties of man-made cellulosic fibres will reassert the fibres as a replacement for the existing fossil-based fibres, thus filling the demand for more environmentally friendly dyeing-solutions in the textile industry. The functionalised Biocelsol fibres were made in Finnish Academy FinnCERES project and are produced by wet spinning technique from the cellulose dope containing low amounts of 3-allyloxy-2-hydroxypropyl substituents. The functionality formed is permanent and has been shown to significantly improve the dyeability of the fibres. In addition, the functionalisation of Biocelsol fibres reduces the cost of textile finishing and dyeing as well as the effluent load.

More information: www.vttresearch.com

6

A New Generation of Bio-based and Resource-efficient Fibre

TreeToTextile (SE)

TreeToTextile has developed a unique, sustainable and resource efficient fibre that doesn't exist on the market today. It has a natural dry feel similar to cotton and a semi-dull sheen and high drape like viscose. It is based on cellulose and has the potential to complement or replace cotton, viscose and polyester as a single fibre or in blends, depending on the application. TreeToTextile Technology™ has a low demand for chemicals, energy and water. According to a third party verified LCA, the TreeToTextile fibre has a climate impact of 0.6 kg CO_2 eq/kilo fibre. The fibre is made from bio-based and traceable resources and is biodegradable.

More information: www.treetotextile.com

Winners of the Innovation Award

“Cellulose Fibre Innovation of the Year 2023”

1 CELLULOSE FIBRE INNOVATION OF THE YEAR 2023 – SPONSORED BY GIG KARASEK – BY NOVA-INSTITUTE – INNOVATION AWARD

Nullarbor™ – From the Latin “Nulla Arbor”, Meaning “No Trees”
Nanollose & Birla Cellulose (AU/IN)

2 CELLULOSE FIBRE INNOVATION OF THE YEAR 2023 – SPONSORED BY GIG KARASEK – BY NOVA-INSTITUTE – INNOVATION AWARD

Circulose® – Makes Fashion Circular
Renewcell (SE)

3 CELLULOSE FIBRE INNOVATION OF THE YEAR 2023 – SPONSORED BY GIG KARASEK – BY NOVA-INSTITUTE – INNOVATION AWARD

Vybrana – The New Generation Banana Fibre
Gencrest Bio Products (IN)

GOLD SPONSOR

Chemistry with a purpose. Better every day.

Chemistry is the invisible enabler for safe, sustainable, and functional cellulose-based products.

At Kemira, we have been working for over a hundred years to create the right kind of chemistry. Today, we have the expertise, know-how, and solutions that play a key role in enabling renewable packaging and textiles. We're keen to work together with future-minded partners across the value chain and help you accomplish your vision.

KEMIRA.COM

Kemira

DAY 2
14 March 2024, 9:00–16:40 (CET)

9:00 **Michael Carus**
nova-Institute (DE)
Conference Opening

9:10 – 10:45

Circular Economy and Recyclability of Fibres

Grand Hall

Chairpersons: Stefanie Fulda & Michael Carus, nova-Institute

9:10

Michael Hummel
Aalto University (FI)
Spun Dyed Lyocell-type Fibres from Colored Textile Waste

9:25

Elina Pesonen
Andritz (FI/AT)
New Opportunities in the Circular Textile Ecosystem

9:40

Edvin Bågenholm-Ruuth
Lund University (SE)
A Solution to Textile Waste: Using an Inorganic Molten Salt Hydrate as a Cellulose Solvent for Textile Recycling

9:55

Inge Schlapp-Hackl
Aalto University (FI)
Lyocell-type Fibres from Banknotes by Means of Ioncell® Technique

10:10

Heli Kangas
Valmet Technologies (FI)
Towards Scale-up – Challenges and Opportunities for Industry in Cellulosic Textile Fibre Production and Recycling

10:25
Panel Discussion with all Session Speakers

10:45
Coffee Break & Networking

GOLD SPONSOR

One person´s trash, another person´s treasure

Lenzing is developing a unique recycling technology that uses waste textiles as a raw material. As a sustainability pioneer, Lenzing is vigorously advancing the topic of recycling with its REFIBRA™ technology to make textile recycling as normal as paper recycling.

More at lenzing.com

Lenzing Innovative by nature

Tencel™ Feels so right

LENZING EcoVero™

Veocel™ Purely for you

LENZING™

GOLD SPONSOR

Enabling Cellulosic Fiber Innovations for Tomorrow

The cellulosic fiber market will diversify and remain very dynamic. Lyocell's potential has not fully been reached yet - and this provides great opportunities for innovators: Pioneering fibers from 100% agro-waste, trendy fibers from 100% bacterial cellulose, high-tenacity fibers from 100% recycled cotton textiles, low-cost fibers from paper pulp, world scale fiber capacities from integrated pulp-fiber plants, fiber tenacities like polyester fibers, fully closed loops with textiles from 100% recycled textiles, etc. - Lyocell will drive many innovations required to survive in the fiber market of tomorrow.

Are you ready for Lyocell 2.0?

LIST provides the Proven Dissolving Technology Platform for any kind of fiber innovation:

- all cellulose sources
- all cellulose concentrations
- all water concentrations
- all solvents
- all process regimes
- all scales - lab to industrial

LIST Technology - preparing you for the future dynamics of the cellulosic fiber market.

LIST
Kneading - Mixing - Drying

JAKOB MÜLLER HOLDING AG

www.list-lyocell.com

11:15 – 12:50

Alternative Feedstocks and Supply Chains

Grand Hall

Chairpersons: Stefanie Fulda & Asta Partanen, nova-Institute

11:15

Gerrit Schaper
Papiertechnische Stiftung (PTS) (DE)
Acetosolv-pulp for Specialty Paper Applications

11:35

Roland Klein
Fraunhofer LBF (DE)
DuroBast – Durable and Resource-Saving Composite Structural Components, based on Innovatively Pretreated and Processed Bast Fibres

11:55

Rosa E. Nascimento
NOVA School of Science and Technology – FCT NOVA (PT)
Optimization of Cellulose Recovery from Banana Plant Pseudostem Using Pre-Treatments

12:15

Diana Cayuela
Universitat Politècnica de Catalunya – BarcelonaTECH (ES)
Production of Cellulosic Fabrics from Agricultural Wastes and Industrial By-products

12:35

Panel Discussion with all Session Speakers

12:50
Lunch Break & Networking

A Poster Session will take Place at the Beginning of the Lunch Break

14:30 – 15:10

Cellulose Fibre based Hygiene Products

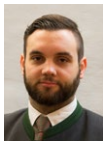
Grand Hall

Chairpersons: Stefanie Fulda & Asta Partanen, nova-Institute

14:30

Roland Kunkel
LIST Technology (CH)
Processing Technology for BioSAP

14:50



Thomas Harter & Ingo Bernt
Graz University of Technology (AT) & Kelheim Fibres (DE)
Geometry Matters: Unveiling Tampon Absorption Mechanisms

15:10 – 15:30

Ionic Liquids and New Technologies for Pulps, Fibres and Yarns (Part 1)

Grand Hall

Chairpersons: Asta Partanen & Michael Carus, nova-Institute

15:10

Antje Ota
German Institutes of Textile and Fiber Research Denkendorf (DITF) (DE)
Natural based Dyes for Cellulose-based Filaments and their Production

15:30
Coffee Break & Networking

16:00 – 16:35

Ionic Liquids and New Technologies for Pulps, Fibres and Yarns (Part 2)

Grand Hall

16:00

Daniela Colevati Ferreira

CeNTI - Centre for Nanotechnology and Smart Materials (PT)

Eucalyptus Globulus Lyocell Process: Optimisation and Incorporation of Reused MMCF

16:20

Panel Discussion with all Session Speakers

16:35 Closing Remarks

Valuable Quotes

Łucja Wanicka
AFRY (FI)
"The Cellulose Fibres Conference is the ideal place for experts within the MMCF and textile industry to exchange ideas, collaborate, and make future together!"

Michael Hummel
Aalto University (FI)
"For a truly circular textile industry we need fiber-to-fiber recycling for new high-quality products that are on par with the original textiles."

Erfan Kimiaei
North Carolina State University & Aalto University (FI)
"Imagine a place where we talk about making packages, hygiene products, and clothes amazing – that's the Cellulose Fibers Conference. Be there and let's team up for a better tomorrow!""

Daniela Colevati Ferreira
CeNTI (PT)
"Wet spinning as a tool to improve Portugal's sustainability in the textile market."

Roland Klein
Fraunhofer LBF (DE)
"Cellulose fibers can have the potential to substitute glass fibers in lightweight construction."

Thomas Harter
Graz University of Technology (AT)
"Conferences like this drive scientific collaboration and innovation, essential for progress in industrial applications."

Julien Bley
Innofibre (CA)
"Cellulose foams: a new environmentally-friendly cellulose product to replace single-use plastics."

Edvin Bågenholm-Ruuth
Lund University (SE)
"Presenting my work on the development of a process to produce novel cellulosic fibres and dissolving pulp from textile waste, I cannot imagine a more fitting occasion to share my findings than at the Cellulose Fibres Conference."

Pertti Nousiainen
NousFibre Consulting (FI)
"The Cellulose Fibres Conference is important to gather experts worldwide amid the challenges of responding to increased demand of bio-based textile fibers with hydrophilic and tensile properties produced with zero carbon footprint."

Sascha Schriever
RWTH Aachen (DE)
"The place to be for innovators in cellulose fibers industry."

Rasaq Semiu Abolore
Technological University Dublin (IE)
"A conference which explores the value chain of cellulose fibres, including lignocellulose, chemical pulp, rayon, viscose, modal, and lyocell, and their applications in renewable textiles, non-wovens, composites, hygiene, packaging, and food industry."

Diana Cayuela
Universitat Politècnica de Catalunya – BarcelonaTECH (ES)
"Agricultural waste and industrial byproducts: Raw material for the textile industry."

Heli Kangas
Valmet (FI)
"At Valmet, we see that by participating in the conference, we will gain the latest information on what is happening in the field of circularity and recyclability of textile fibers and man-made cellulose fibers and also have the opportunity to network with peers."

Man-Made Fibers International is the English-language international trade journal for purchasing decision-makers and the entire management who deal with the topics of man-made fiber production and man-made fiber innovations.

FREQUENCY OF PUBLICATION:

4 x p.a.

1 x p.a. Man-Made Fibers Year Book

READ HERE!

Note:

Man-Made Fibers International - formerly Chemical Fibers International!

TEXTILE TECHNOLOGY

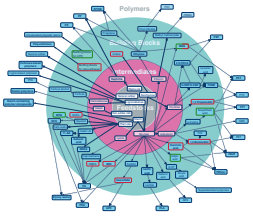
nova Market and Trend Reports on Renewable Carbon

The Best Available on Bio- and CO_2-based Polymers & Building Blocks and Chemical Recycling

NEW

Bio-based Building Blocks and Polymers

Global Capacities, Production and Trends 2023–2028



Authors: Pia Skoczinski, Michael Carus, Gillian Tweddle, Pauline Ruiz, Nicolas Hark, Ann Zhang, Doris de Guzman, Jan Ravenstijn, Harald Käb and Achim Raschka

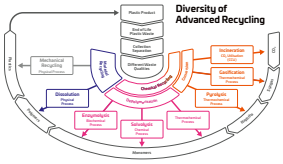
March 2024

This and other reports on renewable carbon are available at **www.renewable-carbon.eu/publications**

NEW

Mapping of Advanced Plastic Waste Recycling Technologies and Their Global Capacities

Providers, Technologies, Partnerships, Status and Outlook



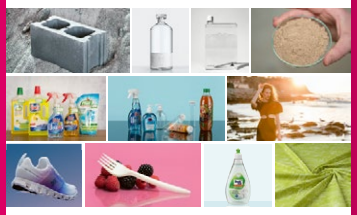
Authors: Lars Krause, Aylin Özgen, Jasper Kern, Sreeparna Das, Michael Carus, and Achim Raschka

February 2024

This and other reports on renewable carbon are available at **www.renewable-carbon.eu/publications**

Carbon Dioxide (CO_2) as Feedstock for Chemicals, Advanced Fuels, Polymers, Proteins and Minerals

Technologies and Market, Status and Outlook, Company Profiles



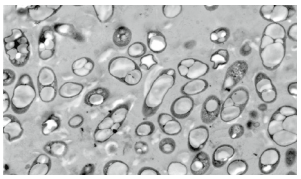
Authors: Pauline Ruiz, Pia Skoczinski, Achim Raschka, Nicolas Hark, Michael Carus. With the support of: Aylin Özgen, Jasper Kern, Nico Plum

April 2023

This and other reports on renewable carbon are available at **www.renewable-carbon.eu/publications**

Mimicking Nature – The PHA Industry Landscape

Latest trends and 28 producer profiles



Author: Jan Ravenstijn

March 2022

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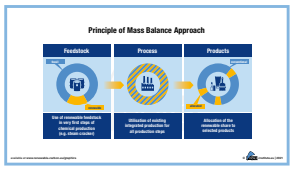
Bio-based Naphtha and Mass Balance Approach

Status & Outlook, Standards & Certification Schemes



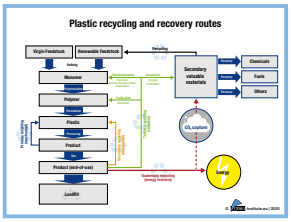
Authors: Michael Carus, Doris de Guzman and Harald Käb

March 2021

This and other reports on renewable carbon are available at **www.renewable-carbon.eu/publications**

Chemical recycling – Status, Trends and Challenges

Technologies, Sustainability, Policy and Key Players



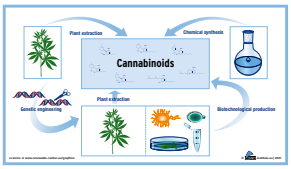
Author: Lars Krause, Florian Dietrich, Pia Skoczinski, Michael Carus, Pauline Ruiz, Lara Dammer, Achim Raschka, nova-Institut GmbH, Germany

November 2020

This and other reports on the bio- and CO_2-based economy are available at **www.renewable-carbon.eu/publications**

Production of Cannabinoids via Extraction, Chemical Synthesis and Especially Biotechnology

Current Technologies, Potential & Drawbacks and Future Development

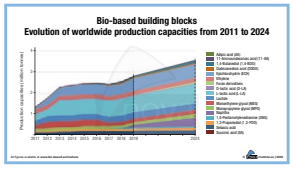


Authors: Pia Skoczinski, Franjo Grotenhermen, Bernhard Beitzke, Michael Carus and Achim Raschka

January 2021

This and other reports on renewable carbon are available at **www.renewable-carbon.eu/publications**

Commercialisation updates on bio-based building blocks



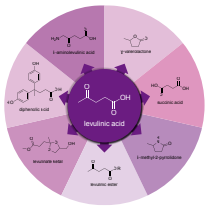
Author: Doris de Guzman, Tecnon OrbiChem, United Kingdom

Updated Executive Summary and Market Review May 2020 – Originally published February 2020

This and other reports on the bio- and CO_2-based economy are available at **www.bio-based.eu/reports**

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

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



Authors: Achim Raschka, Pia Skoczinski, Raj Chinthapalli, Ángel Puente 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**

renewable-carbon.eu/publications

RENEWABLE CARBON PUBLICATIONS

RENEWABLE CARBON INITIATIVE

Bio-based CO_2-based Recycling

Circular Economy

Shape the Future of the Chemical and Material Industry

WHY JOIN RCI?

RCI is an organization for all companies working in and on renewable chemicals and materials – plastics, composites, fibres and other products can be produced either from biomass, directly via CO_2 utilisation, or recycling. RCI members profit from a unique network of pioneers in the sustainable chemical industry, creating a common voice for the renewable carbon economy.

To officially represent the RCI in Brussels, the RCI is registered in the EU's transparency register under the number 683033243622-34.

LinkedIn:
www.linkedin.com/showcase/renewable-carbon-initiative
#RenewableCarbon

Executive Managers:
Christopher vom Berg & Michael Carus

Contact: Verena Roberts
verena.roberts@nova-institut.de

JOIN NOW

Become a part of the Renewable Carbon Initiative (RCI) and shape the future of the chemical and material industry
www.renewable-carbon-initiative.com

Find all current RCI members at:
www. renewable-carbon-initiative.com/members

MEMBERS OF THE INITIATIVE

LARGE SUPPLIERS

ADM, Alfa Laval, BASF*, Beckers, Borealis, Braskem, Clariant, Cosun Beet Company*, Covation Bio, covestro*, Dow, Givaudan*, Peter Greven, H&R, iff*, Kemira, Kuraray, Lenzing*, Lubrizol, Mane, Mercer, Neste*, PCC, SCGC, SHV Energy*, Sloli*, Stepan, Südzucker Group, Sulzer, Svensqo, symrise, TÜV Austria, uniper, UPM Biofore Beyond Fossils*, Verbio, Wacker

SME

AllocNow, avantium, Fibenol, FKuR, futerro, LanzaTech*, nova, SCSglobal Services

BRANDS

Beiersdorf, Continental, Henkel*, LEGO, reckitt, VAUDE

START-UPS

amynova polymers, BioBTX, Chaincraft, clariter, COLIPI, econic, Greenlyte Carbon Technologies, QORE, TripleW

RESEARCH INSTITUTES

IKT Kunststoff Technik Stuttgart, ITA RWTH Aachen University, Leibniz-Institut für Verbundwerkstoffe, NORCE

* Board Member

PARTNERS

CO_2 Value Europe, ECBF, ecp-news, EIHA, Global CO_2 Initiative, GO!PHA, IBB, Renewable Carbon Plastics Magazine, TextileExchange, WWF

ADMINISTRATIVE OFFICE

nova-Institute

- Initiator and scientific backbone
- Organisation, management and coordination of RCI

MEMBERS

Board

- Strategic direction
- Budget allocation
- Highly active
- Max. 20 members

General assembly

- 2–3 main representatives per member
- Identify / define priorities of RCI
- Decide on future projects

PARTNERS

- Support and promote each other
- Advise on specific topics

ACTIVITIES

- Advocacy
- Scientific background reports
- Position papers
- Networking

WORKING GROUPS - Involvement of all interested members

WG Labelling

- Development of a renewable carbon share (RCS) certificate and label

WG Policy

- Position papers
- Factsheets
- Stakeholder dialogues
- Public consultations of regulations

WG Recycling

- Chemical and mechanical recycling
- Position papers
- Strategic reports

WG Sustainability

- Deep understanding and harmonisation of sustainability assessment and reporting
- Position papers
- Strategic reports

RCI OFFERS ITS MEMBERS

ADVOCACY

RCI drives the message of renewable carbon, prepares position papers on relevant aspects and represents its stakeholders to the public and political decision-makers.

REPORTS AND PAPERS

Science-based reports and papers on the concept of renewable carbon and specific aspects to create solid argumentation in favor of the transformation.

NETWORKING

Nobody can do it alone! Together with other RCI members you will create an eco-system for renewable carbon solutions – the renewable carbon community. All RCI members meet twice a year, once in person, once online.

SHAPING THE INITIATIVE

Members actively shape the direction of the initiative and the renewable carbon strategy.

WORKING GROUPS

Members are actively involved in RCI activities via different working groups. Currently, these are “Policy”, “Labeling”, “Recycling” and “Sustainability”.

VISIBILITY

Members are part of the RCI communication activities and therefore highly visible and convey credibility. Get recognised as a pioneer in the transition to renewable carbon.

THE AIM

The aim of the Renewable Carbon Initiative (RCI) is to support and speed up the transition from fossil carbon to renewable carbon for all organic chemicals and materials.

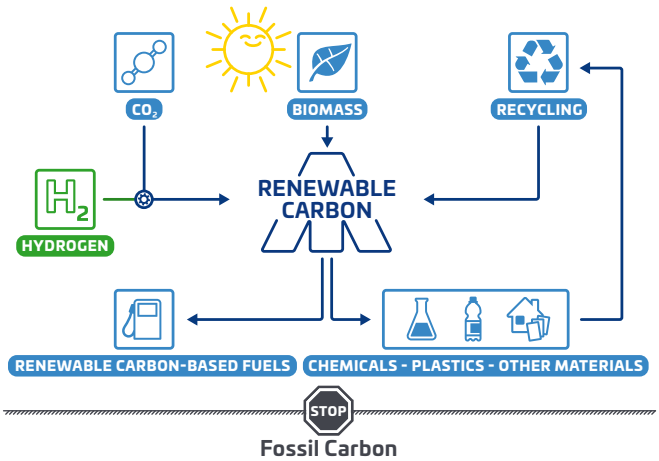
RCI addresses the core problem of climate change, which is extracting and using additional fossil carbon from the ground that will eventually end up in the atmosphere. Companies are encouraged to focus on phasing out fossil resources and to use renewable carbon instead.

The initiative wants to drive this message, initiating further actions by bringing stakeholders together, providing information and shaping policy to strive for a climate-neutral circular economy.

THE VISION

Fossil carbon shall be completely substituted by renewable carbon, which is carbon from alternative sources: biomass, CO_2 and recycling.

RENEWABLE CARBON



Save the Date

CO_2-based Fuels and Chemicals Conference

17–18 April
2024

co2-chemistry.eu

RENEWABLE MATERIALS CONFERENCE

11–13 June
2024

renewable-materials.eu

ADVANCED RECYCLING Conference

20–21 Nov
2024

advanced-recycling.eu

CELLULOSE FIBRES CONFERENCE

12–13 March
2025

cellulose-fibres.eu

Unlock the Power of **Textile & Apparel** Industry Intelligence

Insights on raw materials price for
90+ feedstocks, 240+ fibres, & 350+ yarns for 25+ markets.

Access export-import data & trade analysis for
100+ reporting & 150+ partnering countries by 1000+ HS codes.

TexPro
Driving Intelligent Data

Get detailed macroeconomics and cost indicators of
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Technology & Markets
Achim Raschka (achim.raschka@nova-institut.de)

- Market Research
- Market & Trend Reports
- Innovation & Technology Scouting
- Trend & Competitive Analysis
- Supply & Demand Analysis
- Feasibility & Potential Studies
- Customised Expert Workshops

Communications
Stefanie Fulda (stefanie.fulda@nova-institut.de)

- Comprehensive Communication & Dissemination in Research Projects
- Communication & Marketing Support
- Network of 60,000 Contacts to Companies, Associations & Institutes
- Targeted Newsletters for 19 Specialty Areas of the Industry
- Conferences, Workshops & nova Sessions
- In-depth B2C & Social Acceptance Research

Sustainability
Matthias Stratmann (matthias.stratmann@nova-institut.de)

- Life Cycle Assessments (ISO 14040/44, PEF Conform)
- Carbon Footprint Studies & Customised Tools
- Initial Sustainability Screenings & Strategy Consultation
- Holistic Sustainability Assessment (incl. Social & Economic Impacts)
- GHG Accounting Following Recognised Accounting Standards
- Critical Reviews for LCA or Carbon Footprint Reports
- Sustainability Reporting & Claims

Economy & Policy
Lara Dammer (lara.dammer@nova-institut.de)

- Strategic Consulting for Industry, Policy & NGOs
- Political Framework, Measures & Instruments
- Standards, Certification & Labelling
- Micro- & Macroeconomics
- Techno-Economic Evaluation (TEE) for Low & High TRL
- Target Price Analysis for Feedstock & Products

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nova-Institute is a private and independent research institute, founded in 1994. nova offers research and consultancy with a focus on the transition of the chemical and material industry to renewable carbon.

What are future challenges, environmental benefits and successful strategies to substitute fossil carbon with biomass, direct CO_2 utilisation and recycling? What are the most promising concepts and applications? We offer our unique understanding to support the transition of your business into a climate neutral future.

Our subjects include feedstock, technologies and markets, economy and policy, sustainability, communication and strategy development. Multidisciplinary and international team of 45 scientists.

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