ADVANCED RECYCLING Conference 2022

14–15 November • Cologne (Germany)

CONFERENCE JOURNAL

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nova Institute for Ecology and Innovation

Contact

Dominik Vogt
Conference Manager
+49 2233 – 48 14 49
dominik.vogt@nova-institut.de

advanced-recycling.eu

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13 November 2022, 19:00 (CET)
On the eve of the conference

Proposed meeting point for a social evening gathering

Kölsch Brewery
FRÜH am Dom
Am Hof 12–18
(500 m from the cathedral)

Program of the Conference

Day 1

14 November 2022
10:00–18:00 (CET)

P. 12

Session 1: Advanced Recycling – Status and Outlook
In this session we take a look at the most recent developments of different companies. New strategies, transition to renewable raw materials, acquisitions, and collaborations. Thereby we also keep an eye on the availability of various waste streams and the complementary approach to address them.

Session 2: Policy, Financing and Cooperation
Understanding the political foundations been laid for a meaningful transformation of the circular economy, and what are the challenges? How to finance new recycling plants and how networks can help to strengthen the community.

Session 3: Pyrolysis
Pyrolysis is a versatile tool that is able to complement mechanical recycling and to produce a wide range of different products that can be utilised in the chemical and plastics industry. Collaborations between all these stakeholders are therefore necessary and meaningful to improve the circular economy of plastics.

Day 2

15 November 2022
9:00–17:50 (CET)

P. 17

Session 1: Sustainability and Digitalisation
In this session we will elaborate everything about Life Cycle Assessment (LCA) in context of advanced recycling, how such assessment should and can be performed, what are the open questions and challenges and how to communicate the results. Furthermore, the avoidance of double counting and the tracking of recycled feedstocks throughout complex value chains is another challenge that can be addressed with digital tools.

Session 2: Chemical PET Recycling
PET can be recycled with a versatile set of different tools that will be part of this session. Hear more about depolymerisation via solvents and other chemicals, thermal processes via extruder or biochemical approaches.

Session 3: Dissolution, Solvolysis and More
Plastic packaging as well as various other difficult to recycle materials such as composites and rubber can be addressed with different technologies that will be part of this session.

Session 4: Pre-Processing, Post-Processing and Upgrading
Pre-processing, post-processing, and upgrading technologies are connecting elements to all advanced recycling technologies. Higher yields and product qualities can be achieved with these processes that brings recycling to another level.

ADVANCED RECYCLING Conference 2023
28–29 Nov 2023
Save the Date

Welcome to the First Edition of the "Advanced Recycling Conference" (ARC)

The conference seems to take place in a challenging global period with numerous crises including recent geopolitical developments, the COVID pandemic, natural disasters, and climate change. Alongside these challenges the political framework and commitments of industry and brands, are putting enormous evolutionary pressure on the entire recycling sector.

However, a closer look reveals, that the timing is anything but unfavourable as only together we will be able to advance the development of the circular economy for plastics. Here commonality and especially complementary approaches are essential for the circular economy. For this reason, we deliberately refrain from using the term chemical recycling in the conference title. The event will reach far beyond chemical recycling and further present various new and innovative solutions, that collectively complement and enable each other and thus advance recycling.

Let's face the fact, that chemical recycling alone won't be the silver bullet for all recycling problems and might possibly become a single wheel in a complex gearbox of many other recycling solutions. This leads us to the advanced recycling concept under which all solutions come together. With ARC, we want to offer participants the opportunity to look at the broad variety of new and innovative recycling solutions and developments in detail and to discuss them critically. In the past, we unfortunately had to realise that some discussions only revolve around certain topics and are stuck in an endless loop since they are often driven by tunnel vision, lobbying, bias and competitive fears. Signs of progress look different. If we want to progress, we have to partake in constructive discussions, while being critical.

A growing circular economy of plastics to meet new challenges.

In recent years the developments have set the course for a strategic shift away from fossil feedstocks and towards renewable alternatives. Now it is up to us whether and how we want to and can shape and follow this path. Will we walk this path alone? Likely not! On our path, we will frequently encounter key issues that we have to tackle. New recycling quotas must be achieved, raw materials must be secured and the CO_2 footprint must be reduced. To face these challenges, many actors along the plastics value chain and beyond are collaborating to create new solutions.

The pioneers of tomorrow have already started to establish new value chains and to improve existing ones. New technologies are being developed and successfully up-scaled. At the same time all these activities are accompanied by the question, how they will affect the environment. So, let's get a clearer picture of where we stand and where our joint journey can take us.

Due to the highly positive feedback and the great variety of received abstracts from highly motivated stakeholders, we are confident that this undertaking will be a successful one.

The selected contributions represent a good balance of relevant topics, but with a two-day conference only a small section of the overall picture can be represented. Our last report, "Mapping of advanced recycling - Providers, technologies, and partnerships", introduced more than 100 advanced recycling technologies, exceeding the capacity of one single event. For these reasons, we already decided to organise a second edition of the ARC in the following year. But let's focus on the debut for now.

We are looking forward to a lively exchange and extensive networking with all participants, online as well as offline.

Michael Carus
CEO

Dr Lars Krause
Program

Your Conference Team

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

Dušica Banduka
Zoom & Speaker Management
+49 2233 – 48 14 42
dusica.banduka@nova-institut.de

Vanessa Kleinpeter
Contact & Registration
+49 2233 – 48 14 40
vanessa.kleinpeter@nova-institut.de

Dr Lars Krause
Program
+49 2233 – 48 14 47
lars.krause@nova-institut.de

Jutta Millich
Media & Partnerships
+49 561 – 50 35 80 44
jutta.millich@nova-institut.de

Guido Müller
Sponsoring
+49 2233 – 48 14 44
guido.mueller@nova-institut.de

Dr Anke Schwarzenberger
Matchmaking
+49 173 – 66 32 58 3
anke.schwarzenberger@nova-institut.de

Dominik Vogt
Conference Manager
+49 2233 – 48 14 49
dominik.vogt@nova-institut.de

Registration

advanced-recycling.eu/registration

Venue & Accommodation

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

Phone: +49 221 – 1631-0
frontoffice@maternushaus.de
maternushaus.de

Recommended Hotels
advanced-recycling.eu/venue

Entrance Fee

Day 1 & 2
14–15 November 2022
Ticket for on site and online attendance
incl. dinner buffet
895 €

Day 1
14 November 2022
Ticket for on site attendance
incl. dinner buffet
600 €

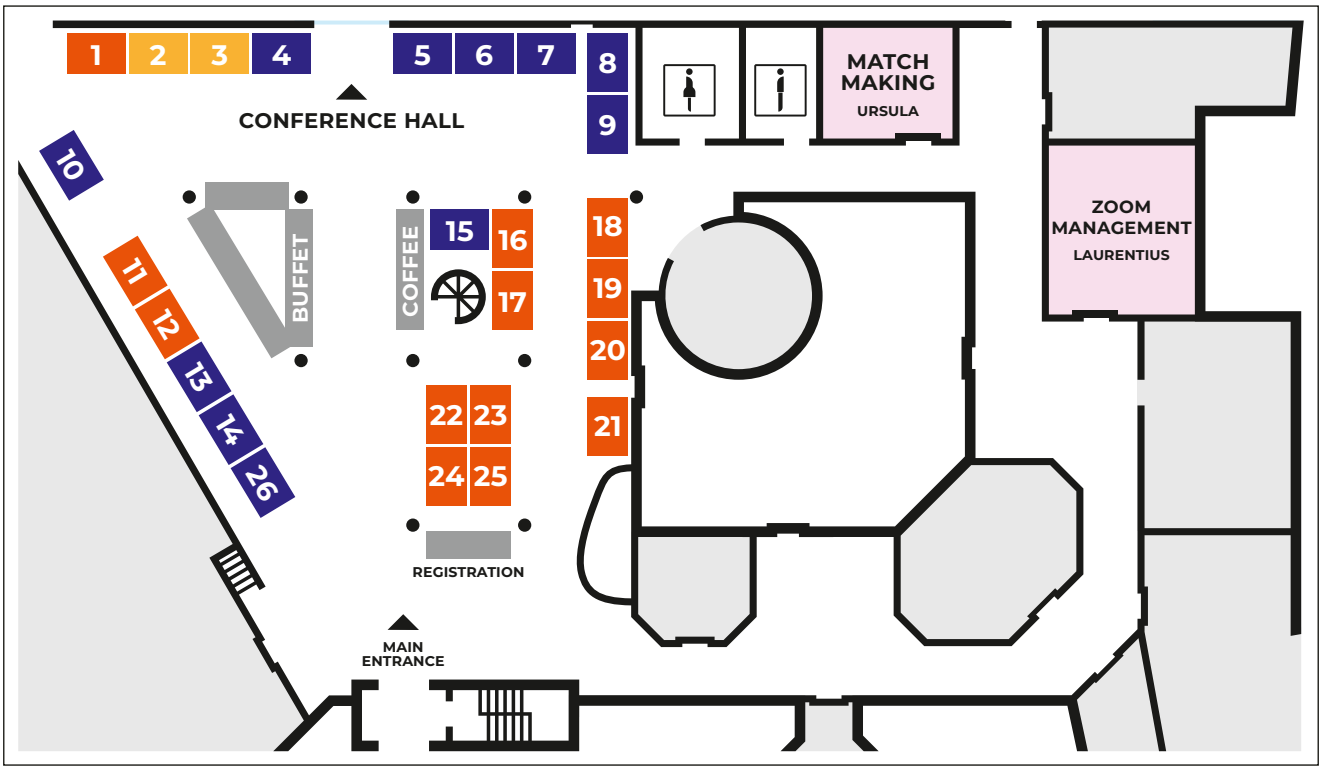
Day 2
15 November 2022
Ticket for on site attendance
550 €

Day 1 & 2 Online Ticket
14–15 November 2022
Ticket for virtual attendance
450 €

Day 1 & 2 Student Ticket
14–15 November 2022
Ticket for on site attendance
incl. dinner buffet
350 €

Exhibition

Free Reserved for Sponsors Booked



List of Exhibitors

Booth 04 **Alfa Laval (NL/SE)**

Booth 05 **BASF (DE)**

Booth 06 **nova-Institute (DE)**

Booth 07 **AIMPLAS (ES)**

Booth 08 **Media Table**

Booth 09 **Poster**
Tharaka Rama Krishna Chowdary Doddapaneni and Timo Kikas (Estonian University of Life Sciences, Tartu, Estonia):
Torrefaction as a treatment option for advanced resource recovery from solid wastes

Booth 10 **Quarzwerke (DE)**

Booth 13 **Kooi Security Deutschland (DE)**

Booth 14 **TA Instruments (US)**

Booth 15 **EREMA (AT)**

Booth 26 **Black IP (DE)**

book your booth soon

Book your booth:
advanced-recycling.eu/exhibition-booking

Status: **7 November 2022**
More exhibitors expected:
advanced-recycling.eu/exhibitors

Matchmaking:

For matchmaking we have prepared a room with tables and chairs for small meetings. Meet at the meeting point; Dr Anke Schwarzenberger from the nova communication department will be happy to assist you.

anke.schwarzenberger@nova-institut.de

nova-Institute for Ecology and Innovation

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- Carbon Footprint Studies & Customised Tools
- Initial Sustainability Screenings & Strategy Consultation
- Holistic Sustainability Assessment (incl. Social and Economic Impacts)
- GHG Accounting Following Recognised Accounting Standards
- Critical Reviews for LCA or Carbon Footprint Reports

Economy & Policy

- 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
Chemiepark Knapsack
Industriestraße 300
50354 Hürth, Germany
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T +49 (0) 22 33 - 46 14 40
F +49 (0) 22 33 - 48 14 50
contact@nova-institut.de
www.renewable-carbon.eu

Study on Advanced Recycling Technologies

The recently published study "Mapping of advanced recycling technologies for plastics waste" presents 103 technologies that are available on the market or will be available soon. Most of the technologies identified are from Europe, led by the Netherlands and Germany, followed by North America, Asia and Australia.

Also featured are initial suppliers of post-processing and upgrading technologies, which play a particularly important role in the conversion of secondary valuable materials into chemicals, materials and fuels. Various technologies at different scales are covered, including gasification, pyrolysis, solvolysis, dissolution, and enzymolysis. All technologies and the companies are comprehensively presented.

Furthermore, the study describes technical details, the suitability of available technologies for specific polymers and waste fractions, and the implementation of existing pilot, demonstration and even (semi-)commercial plants. In addition, all recent developments as well as partnerships and joint ventures are systematically described.

A detailed overview of the technologies and their suppliers

Depending on the technology, different products can be obtained and re-introduced into the cycle at different points in the plastics value chain. The largest capacities are currently found in thermochemical processes.

Pyrolysis

Pyrolysis represents a thermochemical recycling process in which mixed plastic waste (mainly polyolefins) and biomass are converted or depolymerised into liquids, solids, and gases in the presence of heat and absence of oxygen. The products range from various liquid fractions such as oils, diesel, naphtha and monomers to syngas, coal and waxes. Depending on the nature of the products, they can be used as renewable feedstocks to produce new polymers.

Here, a majority of the 62 identified technology providers are from Europe, followed by North America, Asia and Australia. With 25 companies, the majority of suppliers are small companies, followed by micro/start-up, medium and large companies such as Blue Alp (Eindhoven, Netherlands), Demont (Millesimo, Italy), INEOS Styrolution (Frankfurt, Germany), Neste (Espoo, Finland), Österreichische Mineralölverwaltung (OMV) (Vienna, Austria), Repsol (Madrid, Spain), Unipetrol (Prague, Czech Republic), VTT (Espoo, Finland) and Chevron Phillips (The Woodlands, TX, USA). At 40,000 tons per year, pyrolysis currently achieves the second largest capacity.

Solvolysis

Solvent-based solvolysis describes a chemical process based on depolymerisation that can be carried out with various solvents. In this process, polymers (mainly PET) are broken down into their building blocks (e.g. monomers, dimers, oligomers). After the breakdown, the building blocks are separated from the other plastic components (e.g. additives, pigments, fillers, non-targeted polymers). After purification, the building blocks are polymerised to synthesise new polymers.

Compared to pyrolysis, there are fewer suppliers active on the market, which also offer smaller capacities of up to 10,800 tons per year. Of the 22 identified solvolysis technology providers, the majority is based in Europe, followed by North America and Asia.

With eight companies, the majority of suppliers are among the small companies, followed by large, medium and micro/start-up companies. Large companies include Aquafil (Arco, Trentino, Italy), Eastman Chemical Company (Kingsport, TN, USA), IFP Energies Nouvelles (IFPEN) (Rueil-Malmaison, France), International Business Machines Corporation (IBM) (Armonk, NY, USA), DuPont Teijin Films (Tokyo, Japan), and Dow (Midland, MI, USA).

Gasification

Gasification is another thermochemical process that can convert mixed plastic waste and biomass into syngas and CO_2 in the presence of heat and oxygen. Currently, the largest capacities achieved are up to 100,000 tons per year. Most of the suppliers are based in North America. With four companies each, most of the suppliers are small and medium-sized enterprises. The only large company identified was Eastman (Kingsport, TN, USA).

Dissolution

Dissolution describes a solvent-based technology based on physical processes. It allows targeted dissolution of polymers from mixed plastic waste in a suitable solvent, while retaining the chemical structure of the polymer. Other plastic components (e.g. additives, pigments, fillers or non-targeted polymers) remain undissolved and can be separated from the dissolved target polymer. An antisolvent is then added to initiate precipitation of the target polymer. The polymer can thus be obtained directly; unlike solvolysis, this process does not require a polymerisation step. Currently, the process reaches a maximum capacity of 8,000 tons per year, with most technology suppliers coming from Europe, followed by Asia and North America. With four companies, most of the suppliers are mainly small companies, followed by micro/start-up, medium-sized and one large company, which is represented by Shuye Environmental Technology (Shantou, China).

Enzymolysis

An alternative route is offered by enzymolysis, a technology based on biochemical processes that use various types of biocatalysts to depolymerise a polymer into its building blocks. The technology is currently in an early stage of development and is only available on a laboratory scale. Currently, only one supplier of an enzymolysis technology has been identified, which is a small company in Europe.

Mapping of advanced recycling technologies for plastics waste – Providers, technologies, and partnerships

Published in June 2022
Description of various recycling technologies
- Pyrolysis
- Solvolysis
- Gasification
- Dissolution
- Enzymolysis

Market and technology data for 2022
> 100 Technologies / Company Profiles

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The Program of the Advanced Recycling Conference Illustrates the Dynamic Development of the Plastics Recycling Sector

Recent developments in markets and policy indicate a clear transformation and long-lasting change in the circular economy of plastics.

While the European Green Deal has set the overarching aim for the European Union, markets and big industrial players as well as emerging start-ups and everything in-between have set off on a journey to implement and establish advanced recycling solutions worldwide.

Still, some milestones in this quest can only be achieved through co-operation, partnerships, acquisitions, or fusions which could be observed throughout many announcements of past year. Especially the most recent developments point towards strategies that build bridges between conventional mechanical recycling and advanced recycling technologies in which both elements complement each other.

Versatile and innovative landscape of advanced recycling technologies

The current landscape offers a versatile set of different technologies that serve as an interface between a wide range of different waste streams and products to further improve existing or establish new value chains.

These technologies are based on mechanical, physical, biochemical, chemical, and thermo-chemical processes whereby the borders of some processes may be floating. Not all pathways could be ecologically or economically meaningful for all different waste streams which is currently extensively evaluated and discussed.

A Life Cycle Assessment (LCA) is the most widely recognised and accepted methodology for analysing potential environmental impacts to assess environmental sustainability. Several LCAs on different recycling technologies and value chains are already published.

However, critical aspects remain to be discussed and clarified, for instance on how to conduct such assessment in detail and which parameters to consider in order to compare the different technologies, feedstocks, and products with each other to draw meaningful conclusions.
Besides the recycling technologies, pre- and post-processing as well as upgrading technologies represent important pillars for the establishment of meaningful value chains and together contribute to the evolution of the circular economy.

We are happy to offer you a comprehensive program that gives all attendees the opportunity to gain deep insights into all these recent developments. Aside the talks we will have several opportunities for networking with a variety of stakeholders along the entire plastics value chain.

advanced-recycling.eu/program

Day 1

14 November 2022
10:00–18:00 (CET)

10:00

Michael Carus
nova-Institute (DE)
Conference Opening

Advanced Recycling – Status and Outlook

10:10

Michael Wiener
DSD – Duales System (DE)
Carlos Monreal
Plastic Energy (UK)
Closed Loop Recycling – Building Bridges Between Chemical and Mechanical Recycling

10:30

Richard von Goetze
Interzero (DE)
Camiel Steffanie
Eastman (NL/US)
Leveraging Synergies for Circularity – Interzero & Eastman Keeping Hard-to-Recycle PET out of Incineration

10:50

Bart Suijkerbuijk
Shell (NL)
Shell's Role in the Circular Value Chain

11:10

Maiju Helin
Neste (FI)
Role of Chemical Recycling in Industrial Transformation – Neste View

11:30

Andreas Hackl
Next Generation Elements (AT)
Advanced Recycling – From a Technology Provider Prospective

11:50
Discussion with all Speakers of the Session

12:10
Lunch & Networking

Policy, Financing and Cooperation

13:40

Lara Dammer
nova-Institute (DE)
From Policy to Implementation – Challenges in the Years Ahead

14:00

Tom Hesselink
KPMG (NL)
The Green Deal: A Game Changer for the Waste Management and Plastics Industries

14:20

Peter Sandkuehler
Dow Chemical (CH/US)
Plastic Circularity and Its Key Role for the European Policy, Regulatory Initiatives and Market Trends

14:40

Marc Borghans
ING (NL)
Financing Innovative Plastic Recycling and Bioplastics Plants

15:00

Joop Groen
Circular Biobased Delta (NL)
CBBD Network Chemical Recycling: "The Power of Collaboration"

15:20
Discussion with all Speakers of the Session

15:40
Coffee Break & Networking

Diversity of Advanced Recycling

16:00

Lars Krause
nova-Institute (DE)
Mapping of Advanced Recycling Technologies for Plastics Waste

Pyrolysis

16:20

Tijmen Vries
BioBTX (NL)
Full Carbon Circularity Made Possible

16:40

Wolfgang Hofer
OMV Downstream (AT)
OMV ReOil® – Chemical Recycling – A Technology Enabling the Recycling of Plastics Complementary to Mechanical Recycling

17:00

Stephan Roest
Borealis (AT)
Borealis, Thinking Circular to Close the Loop

17:20

Carsten Larsen
Agilyx (US)
An Integrated Approach to Chemical Recycling

17:40
Discussion with all Speakers of the Session

18:00
Networking

20:00
Gala Dinner

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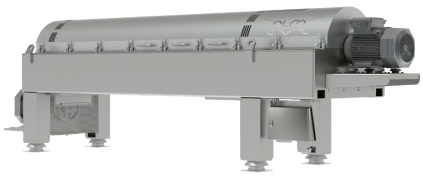

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Day 2

15 November 2022
9:00–17:50 (CET)

9:00

Lars Krause
nova-Institute (DE)
Conference Opening

Sustainability and Digitalisation

9:10

James Veale
GreenToken by SAP (AU/DE)
Material Traceability for Increased Circularity in the Chemical Industry – A Blockchain-Based Mass Balance Approach Using GreenToken by SAP©

9:30

Carolin Deregowski
BASF (DE)
LCA of Chemical Recycling of Mixed Plastic Waste

9:50

Virginie Bussières
Pyrowave (CA)
Transparent Communication: A Case Study of the LCA of the Pyrowave-Michelin Project

10:10

Matthias Stratmann
nova-Institute (DE)
Sustainability in Advanced Recycling – Assessments and Open Questions

10:30
Discussion with all Speakers of the Session

10:50
Coffee Break & Networking

Chemical PET Recycling

11:10

Mathias Kirstein
RITTEC Umwelttechnik (DE)
Innovative Back-To-Monomer Recycling – Solution for Mixed PET/Polyester Waste

11:30

Franz-Xaver Keilbach
KraussMaffei Extrusion (DE)
Solvent-Based and Chemical Recycling with Single and Twin-Screw Extrusion

11:50

Vivek Tandon
revalyu Resources (DE)
A Unique, Fully Commercialised, Chemical PET Recycling Process

12:10

Mathieu Berthoud
CARBIOS (FR)
Recycling any Kind of PET Wastes Into any Kind of PET Products: The Power of Biology

12:30
Discussion with all Speakers of the Session

12:50
Lunch & Networking

Dissolution, Solvolysis and More

14:20

Solenne Brouard Gaillot
Polystyvert (CA)
Dissolution of Styrenic Plastics – Purification of Polystyrene and Beyond

14:40

Alberto Barranca Jiménez
AIMPLAS (ES)
Composites: EoL Solutions Using Chemical Recycling Technologies

15:00

Danka Katrakova-Krüger
TH Köln (DE)
Rubber Recycling

15:20
Discussion with all Speakers of the Session

15:40
Coffee Break & Networking

Pre-Processing, Post-Processing and Upgrading

15:50

Anne-Marie de Moei-Galera
Alfa Laval (NL/SE)
Alfa Laval Contributions in Chemical Recycling of Tires and Plastic via Pyrolysis

16:10

Luis Hoffmann
Sulzer Chemtech (CH)
Overcoming the Challenge of Purification in Chemical Recycling

16:30

Klaus Lederer
EREMA Group (AT)
Physical Input Stream Preparation Solutions for Chemical Recycling Technologies

16:50

Frieder Dreisbach
TA Instruments – a Division of Waters (DE)
Advancing Circular Economy and Closed Material Cycles by Improving Chemical Recycling Processes Through Thermal Analysis

17:10

Sabine Schoenfeld
Coperion (DE)
Recycling Plastics With the Twin Screw Extruder – Challenges and Solutions for Mechanical, Advanced and Solvent-based Recycling

17:30
Discussion with all Speakers of the Session

17:50
Networking

Valuable Quotes

Agilyx (US)
Carsten Larsen
"For plastics recycling to be successful, an integrated solution that considers both a robust chemical recycling technology and an innovative approach to feedstock management is necessary."

AIMPLAS (ES)
Alberto Barranca Jiménez
"Composites (plastics reinforced with carbon and glass fibres): New end-of-life solutions (combination of mechanical and chemical recycling technologies)."

Alfa Laval (NL/SE)
Anne-Marie de Moei-Galera
"Accelerating advanced recycling technologies with agile separation solutions: A pyrolysis case."

BASF (DE)
Carolin Deregowski
"LCA of chemical recycling."

BioBTX (NL)
Tijmen Vries
"The connection between electrons and renewable carbon."

Carbios (FR)
Mathieu Berthoud
"Presenting Cabrios' vision of its unique enzymatic depolymerisation technology."

Circular Biobased Delta (NL)
Joop Groen
"The development speed in the field of advanced recycling is unbelievable and in this dynamic arena joining forces helps us to move ahead much faster."

Eastman (NL/US)
Camiel Steffanie
"Molecular recycling and mechanical recycling need to join forces to achieve plastics circularity."

EREMA Group (AT)
Klaus Lederer
"Reliable and energy-efficient material preparation and introduction into the chemical recycling reactor is key for successful operations of complex chemical recycling processes. The presentation will show different approaches and solutions depending on target wastestreams."

GreenToken by SAP (AU/DE)
James Veale
"Learn how GreenToken by SAP is providing the chemical and plastics industry with absolute proof that their products have a high percentage of circular content and hence accelerate the transition to a circular economy."

ING (NL)
Marc Borghans
"Taking financing considerations on board in an early stage of development is of crucial importance for the success and commercial scale up of innovative plastic recycling and bioplastics projects."

Interzero (DE)
Richard von Goetze
"Realising a world without waste through chemical recycling."

KraussMaffei Extrusion (DE)
Franz-Xaver Keilbach
"Extruders are urgently necessary to reach high quantities and best qualities within chemical recycling processes."

KPMG (NL)
Tom Hesselink
"How the green deal can generate value in recycling."

Neste (FI)
Maiju Helin
"Neste collaborates with several plastics value chain partners to develop chemical recycling technologies and capacity. This helps to increase circularity of materials and promotes an economy where plastics are produced without virgin fossil oil."

Polystyvert (CA)
Solenne Brouard Gaillot
"How polystyvert is setting a circular economy in styrene based plastic thanks to its innovative dissolution technology."

Pyrowave (CA)
Virginie Bussières
"Chemical recycling brings growth opportunities with the creation of new circular value chains."

revalyu Resources (DE)
Vivek Tandon
"A unique, fully commercialised and highly efficient chemical based PET recycling process."

RITTEC Umwelttechnik (DE)
Mathias Kirstein (DE)
"Enabling a truly circular economy: Continious back-to-monomer recycling demonstrated on mixed polyester and multilayer packaging waste."

Shell (DE)
Bart Suijkerbuijk
"How to reach Shell's ambition to use one million tonnes of plastic waste in its global chemicals plants by 2025."

Sulzer Chemtech (DE)
Luis Hoffmann
"Sulzer's tailored purification technologies solve the key challenge of advanced polymer recycling – The generation virgin-equivalent raw materials at large scale!"

TA Instruments – a Division of Waters (DE)
Frieder Dreisbach
"High-pressure thermogravimetry enables the development of chemical plastics recycling processes on the laboratory scale under real process conditions yielding results which can be directly transferred to industrial scale."

Technische Hochschule Köln (DE)
Danka Katrakova-Krüger
"Overview of rubber recycling today with its advantages and challenges."

Media Partners

bioplasticsmagazine.com

chemanager-online.com

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circular-technology.com

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Shape the Future of the Chemical and Material Industry

RENEWABLE CARBON INITIATIVE

Bio-based | CO_2-based | Recycling

Circular Economy

Renewable Carbon Initiative (RCI) was founded in September 2020.
RCI members are committed to create a sustainable, fossil-free future for the chemical and material industry.

WHY JOIN RCI?

RCI is an organization for all companies working in and on sustainable chemicals and materials – renewable chemicals, 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.

RCI OFFERS ITS MEMBERS

- A common voice for the renewable carbon economy.
- Increased visibility of their individual renewable carbon solutions.
- Collective advocacy work to create a supportive regulatory and economic framework.
- Support in finding solutions for your specific problems on the way to your renewable carbon goals.

MEMBERS

ADM, ALPLA, avantium, BASF, Beiersdorf, BioBTX, BOREALIS, CLARIANT, clariter, Cosun Beet Company, COVATION BIO, covestro, DOW, EVONIK, Firmenich, FKuR, futerro, Givaudan, Henkel, H&R, IBB Network GmbH, iff, IKT Kunststoff Technik Stuttgart, ITA RWTH Aachen University, LanzaTech, Leibniz-Institut für Verbundwerkstoffe, Lenzing, Lubrizol, MANE, NESTE, NORCE, nova, PCC SE, reckitt, SHV ENERGY, stahl, SÜDZUCKER GROUP, SULZER, SUNCOAL, symrise, TripleW³, TÜV AUSTRIA, uniper, UPM BIOFORE BEYOND FOSSILS, VAUDE, Verbio Biofuel and Technology, WACKER

PARTNERS

CO_2 VALUE EUROPE, ECBF, Global CO_2 Initiative University of Michigan, GO!PHA Global Organization for PHA, TextileExchange, WWF

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/membership/application

More members, partners and information
www.renewable-carbon-initiative.com
Contact: **dominik.vogt@nova-institut.de**
#renewablecarbon

CELLULOSE FIBRES CONFERENCE 2023
Cologne (Germany) 8–9 March

The only conference dealing exclusively with cellulose fibres – Solutions instead of pollution

Cellulose fibres are bio-based and biodegradable, even in marine-environments, where their degrading does not cause any microplastic.

250 participants and 30 exhibitors are expected in Cologne to discuss the following topics:

- Strategies, Policy Framework of Textiles and Market Trends
- New Opportunities for Cellulose Fibres in Replacing Plastics
- Sustainability and Environmental Impacts
- Circular Economy and Recyclability of Fibres
- Alternative Feedstocks and Supply Chains
- New Technologies for Pulps, Fibres and Yarns
- New Technologies and Applications beyond Textiles

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

Call for Innovation

Apply for the "Cellulose Fibre Innovation of the Year 2023"

Organiser: nova Institute for Ecology and Innovation

Award Sponsor: GIG KARASEK A Member of Dr. Aichhorn Group

Sponsors: DIENES, Kelheim Fibres, Lenzing Innovative by nature

cellulose-fibres.eu

Conference on CO_2-based Fuels & Chemicals 2023

19–20 April • Cologne (Germany)

Leading Event on Carbon Capture & Utilisation

Learn about the entire CCU value chain:

- Carbon Capture Technologies and Direct Air Capture
- CO_2 for Chemicals, Proteins and Gases
- Advanced CCU Technologies, Artificial Photosynthesis
- Fuels for Transport and Aviation
- Green Hydrogen Production
- Mineralisation
- Power-to-X

SPONSORED BY YNCORIS 1 Best CO_2 Utilisation 2023 ORGANISER NOVA-INSTITUTE INNOVATION AWARD

Call for Innovation
Apply for the Innovation Award "Best CO_2 Utilisation 2023"

Organiser: nova Institute

Award Sponsor: YNCORIS Industrial Services

co2-chemistry.eu

RENEWABLE MATERIALS CONFERENCE 2023

23–25 May • Siegburg/Cologne (Germany)

renewable-materials.eu

The brightest stars of Renewable Materials

The unique concept of presenting all renewable material solutions at one event hits the mark: bio-based, CO_2-based and recycled are the only alternatives to fossil-based chemicals and materials.

First day
- Bio- and CO_2-based Refineries
- Chemical Industry, New Refinery Concepts & Chemical Recycling

Second day
- Renewable Chemicals and Building Blocks
- Renewable Polymers and Plastics – Technology and Markets
- Innovation Award
- Fine Chemicals (Parallel Session)

Third day
- Latest nova Research
- The Policy & Brands View on Renewable Materials
- Biodegradation
- Renewable Plastics and Composites

RENEWABLE MATERIAL OF THE YEAR 2023 1 ORGANISED BY NOVA-INSTITUTE SPONSORED BY COVESTRO INNOVATION AWARD

Call for Innovation
Submit your Application for the "Renewable Material of the Year 2023"

Organiser: nova Institute

Award Sponsor: covestro

Platin Sponsor: UPM BIOFORE BEYOND FOSSILS

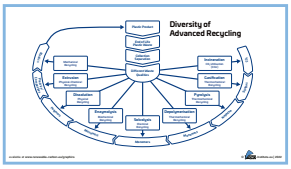
Gold Sponsors: ALFA LAVAL, COVATION BIO, iff, sappi, SUGAR ENERGY, TÜV AUSTRIA

nova Market and Trend Reports on Renewable Carbon

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

Mapping of advanced recycling technologies for plastics waste

Providers, technologies, and partnerships



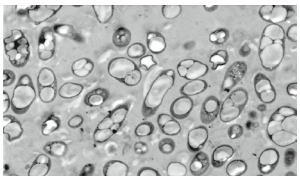
Authors: Lars Krause, Michael Carus, Achim Raschka and Nico Plum (all nova-Institute)

June 2022

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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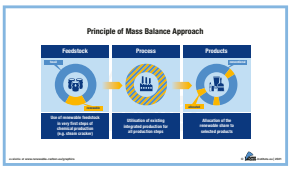
Bio-based Naphtha and Mass Balance Approach

Status & Outlook, Standards & Certification Schemes

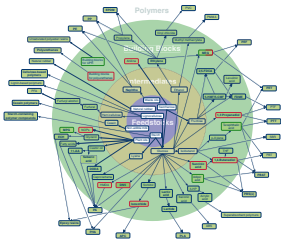


Authors: Michael Carus, Doris de Guzman and Harald Käb

March 2021

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

Bio-based Building Blocks and Polymers – Global Capacities, Production and Trends 2020–2025



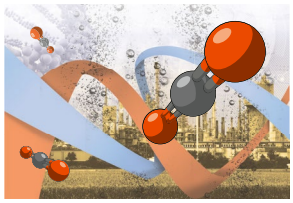
Authors: Pia Skoczinski, Michael Carus, Doris de Guzman, Harald Käb, Raj Chinthapalli, Jan Ravenstijn, Wolfgang Baltus and Achim Raschka

January 2021

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

Carbon Dioxide (CO_2) as Chemical Feedstock for Polymers

Technologies, Polymers, Developers and Producers



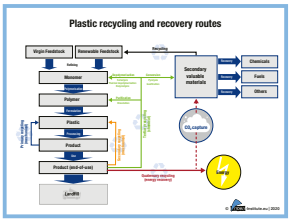
Authors: Pauline Ruiz, Achim Raschka, Pia Skoczinski, Jan Ravenstijn and Michael Carus, nova-Institut GmbH, Germany

January 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



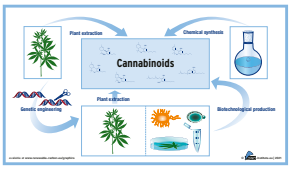
Author: Lars Krause, Florian Dietrich, Pia Skoczinski, Michael Carus, Pauline Ruiz, Lara Dammer, Achim Raschka, nova-Institut GmbH, Germany

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

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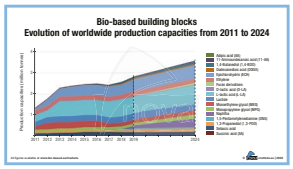
Commercialisation updates on bio-based building blocks



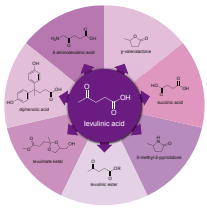
Author:
Doris de Guzman, Tecnon OrbiChem, United Kingdom

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

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renewable-carbon.eu/publications

RENEWABLE CARBON PUBLICATIONS

nova Institute for Ecology and Innovation

See you next year

ADVANCED RECYCLING
Conference 2023

28–29 November • Cologne (Germany)

advanced-recycling.eu

22-11-07