

4th Conference on CO₂

Carbon Dioxide
as Feedstock for
Fuels, Chemistry
and Polymers

www.CO2-chemistry.eu

Carbon Dioxide as Feedstock – for Fuels, Chemistry and Polymers

29–30 September 2015, Haus der Technik, Essen (Germany)

Patronage

Ministry of Innovation, Science
and Research of the German State
of North Rhine-Westphalia



www.wissenschaft.nrw.de

Premium Partner

EnergieAgentur.NRW
klimaschutz made in nrw

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Biggest Event on CO₂ as Feedstock



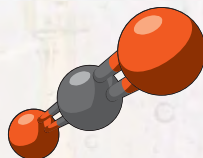
1st Day, 29 September 2015

**Policy & Visions ++ H₂ Generation:
Prerequisite for CO₂-Economy**



2nd Day, 30 September 2015

**CO₂ Capture & Purification ++
Chemicals & Polymers ++
CO₂-based Fuels**



- Programme of the Conference
- Exhibitors
- and many more

NEW

Newsticker on Carbon Capture and Utilization!
Free Access: www.co2-chemistry.eu/news

4th Conference on

CO₂

Carbon Dioxide
as Feedstock for
Fuels, Chemistry
and Polymers

Venue

Haus der Technik e.V.

Hollestraße 1
45127 Essen, Germany
Phone: +49 (0)201 1803-1
www.hdt-essen.de



Conference Team



Michael Carus
CEO

michael.carus@nova-institut.de



Achim Raschka
Programme, Poster session

+49 (0)2233 4814-51
achim.raschka@nova-institut.de



Barbara Dommermuth
Programme, Poster session

+49 (0)2233 4814-56
barbara.dommermuth@nova-institut.de



Dominik Vogt
Conference Manager,
Organisation, Exhibition,
Sponsoring

+49 (0)2233 4814-49
dominik.vogt@nova-institut.de



Jutta Millich
Partners & Media Partners

+49 (0)561 503580-44
jutta.millich@nova-institut.de



Ina Hellge
Contact, Registration,
Organisation

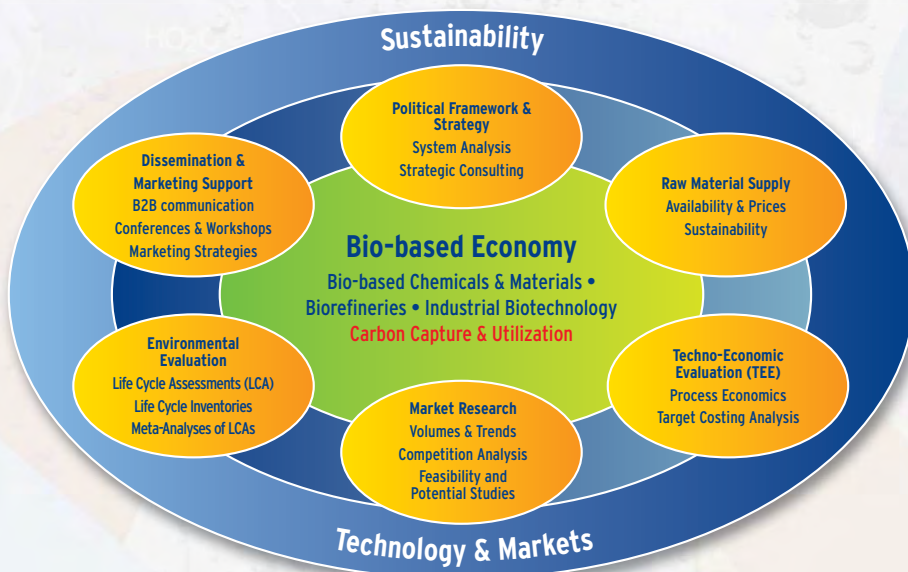
+49 (0)2233 4814-64
ina.hellge@nova-institut.de



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Our nova-Institute's Services in the bio-based Economy for Companies, Associations and Politics





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Message of Greeting

Reduction of CO₂ emissions as a challenge facing society

With 'CO₂ as Feedstock for Fuels, Chemistry and Polymers', you are addressing a major issue of our time.

Emissions of anthropogenic carbon dioxide are expected to rise by 30 % by 2030, over 2010 figures. This would go hand in hand with an increase of the worldwide average temperature of up to six degrees centigrade. Whilst of course the stated aim, internationally, has been to limit global warming to two degrees. International projections and reduction targets still differ by a wide margin.

In order to close this gap, we must have dialogue and proper cooperation. This conference, the scientific discourse, the exchange and cooperation among research, business and government can make an important contribution.

Opting for North Rhine Westphalia (NRW) as the venue for your conference was the right decision.

NRW is a centre of the chemical industry. In terms of turnover, North Rhine Westphalia is No 1 in Germany and amongst the leaders in Europe. But also NRW has a long tradition as a centre of research. Top-notch research facilities are a unique selling point. Innovation is driven by the large concentration of 72 universities and more than 50 non-university research establishments, which have turned the state into Europe's knowledge region par excellence. The cooperation of the research and business communities is a genuine driver of innovation in North Rhine Westphalia.

In order to put a brake on global warming and with a view to mastering the transition to sustainable energy sources, we need clever and efficient ways to manage resources and energy, and that includes more closed-loop recycling.

I wish you a very successful conference, a fruitful exchange of know-how and ideas and a lot of impetus for new joint projects that will help us tackle the 'grand challenges'.

Dr.-Ing. Walther Pelzer

Ministry of Innovation, Science and Research of the German State of North Rhine-Westphalia

Patronage

**Ministry of Innovation,
Science and Research of
the German State of North
Rhine-Westphalia** 



The conference is under the
patronage of

Svenja Schulze

Minister of Innovation, Science and
Research of the German State of
North Rhine-Westphalia



Opening Words
Dr.-Ing. Walther Pelzer


Ministry of Innovation, Science
and Research of the German State
of North Rhine-Westphalia



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PROGRAMME OF THE 1st DAY, 29 SEPTEMBER 2015


09:30 Registration and Welcome Coffee
10:00 Conference Opening, nova-Institut GmbH  Michael Carus
Opening words of the Ministry of Innovation, Science and Research of the German State of North Rhine-Westphalia (MIWF)  Dr. Walther Pelzer

POLICY & VISIONS




Chairwoman
Kathryn Sheridan
Sustainability Consult 



10:10 European Commission, DG Energy 
Andreas Pilzecker
The Role of CCU Fuels in the Revised Renewable Energy Directive




10:40 European Commission, DG Research & Innovation 
Soren Bowadt
DG Research and Innovation Activities Related to CO₂ Conversion



11:10 Federal Ministry of Education and Research (BMBF) 
Dr. Lothar Mennicken
Update on the German R&D Programme for CO₂ Utilization

11:40 Coffee Break



12:00 Federal Environment Agency (UBA) 
Dr. Martin Lange
Carbon Neutral Transport in Germany: Contribution of Power-to-X Fuels



12:30 nova-Institut GmbH 
Michael Carus
Future Potential for CO₂-Economy – How to Cover the Demand for Fuels and Chemicals in 2050?

13:00 Press Conference & Lunch Break




Chairman
Dr. Lothar Mennicken
Federal Ministry of Education and Research (BMBF) 



14:00 Joule Unlimited Inc. 
Kees van de Kerk
Recycling Waste CO₂ into Carbon-Neutral Fuels




14:30 EnergieAgentur.NRW GmbH 
Dr. Frank Köster
Green Growth and Bioeconomy from a Regional Perspective



15:00 Joint Research Center (JRC) 
Dr. Mar Pérez-Fortes
Fuel Production from CO₂ – Methanol and Formic Acid Case Studies



15:30 UK Center for Carbon Dioxide Utilization / SCOT 
Katy Armstrong
Understanding the Potential of CO₂ Utilization


16:00 Coffee Break

H₂ GENERATION: PREREQUISITE FOR CO₂-ECONOMY




Chairwoman
Linsey Garcia-Gonzalez
VITO NV 




16:30 Ruhr University Bochum 
Dr. Fabio La Mantia
Properties of Novel Composite Gas Separators for Alkaline Electrolysis



17:00 MicrobEnergy GmbH / Viessmann Group 
Thomas Heller
Power-to-Gas: Synthetic Methane from Hydrogen and Carbon Dioxide



17:30 Boston College 
Prof. Dr. Dunwei Wang
Generating Hydrogen using Solar Energy by Low-Cost Materials

18:00 Discussion with Speakers from the First Day

20:00 Dinner Buffet



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PROGRAMME OF THE 2nd DAY, 30 SEPTEMBER 2015

09:00 Start of the Second Day

CO₂ CAPTURE & PURIFICATION



Chairwoman
Julie Horn
NewCO₂Fuels
Ltd.



09:00 CarbonOrO BV
Pieter Verberne
*CO₂-Capture using Low-Temperature
Amine Desorption*



09:30 ANTECY BV
Dr. Timo Roestenberg
ANTECY: Fueling the Future

CHEMICALS & POLYMERS



Chairman
Michael Carus
nova-Institut GmbH



10:00 University of York
Prof. Dr. Michael North
Green Syntheses of Cyclic Carbonates

10:30 Coffee Break



**11:00 Covestro (formerly
Bayer MaterialScience)**
**Dr. Christoph Gürtler
& Dr. Jochen Norwig**
*New Activities of Covestro in
CO₂ Utilization*



11:30 University of Sheffield
Prof. Dr. Peter Styring
*Strategies for the Direct Synthesis of Polymers
and Small Molecule Organics from Flue Gas*

CO₂-BASED FUELS



Chairman
Dr. Frank Köster
EnergieAgentur.NRW GmbH



**12:00 Joint Centre for Artificial
Photosynthesis (JCAP)**
Prof. Dr. Nathan Lewis
*Sunlight-Driven Hydrogen Formation by
Membrane-Supported Photoelectrochemical
Water Splitting*



12:30 Carbon Recycling International
Benedikt Stefánsson
*Converting Power to Methanol
by Carbon Recycling*

13:00 Lunch Break



14:00 sunfire GmbH
Christian von Olshausen
*Power-to-Liquids: sunfire's Activities
in Synthetic Hydrocarbons from CO₂,
H₂O and Electricity*



**14:30 Council for Scientific and Industrial
Research (CSIR)**
Prof. Dr. Tobias Bischof-Niemz
*Potential for Power-to-X in South African
Process Industries*



15:00 Bauhaus Luftfahrt e.V. / SOLAR JET
Dr. Andreas Sizmann
*Sunlight-to-Liquid based on Solar-Thermochemical
Reduction of CO₂ – Progress and Perspectives*

15:30 Coffee Break



Chairman
Dr. Achim Schaadt
Fraunhofer-Institut für
Solare Energiesysteme
ISE



16:00 NewCO₂Fuels Ltd.
Julie Horn
A Case Study for CO₂ Utilization



16:30 Hochschule für Technik Rapperswil
Prof. Dr. Markus Friedl
Carbon Capturing for Sustainable Energy Supply



**17:00 Johannes Kepler University
of Linz**
Stefanie Schlager
*Bio-Electrocatalytic CO₂ Reduction
using Enzymes and Microorganisms*

17:30 Networking Reception with Snack

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Exhibitors

Booth No. A1:

Bio Base Europe Pilot Plant

Rodenhuizekaai 1, 9042 Gent, Belgium

Contact: Muriel Dewilde – *Business Development Manager*

Mobile: +32 477 75 62 35

muriel.dewilde@bbeu.org

www.bbeu.org



Booth No. A2:

Zeton BV

PO Box 9 – 7500 AA ENSCHEDE – The Netherlands
Marssteden 206 – 7547 TD ENSCHEDE

Phone: +31 53 428 41 00

Fax: +31 53 428 41 99

info@zeton.nl

www.zeton.com



Booth No. A3:

ViTO NV

sustainablechemistry@vito.be

<https://vito.be/en/chemistry/efficient-reactions/electro-conversion-to-chemicals>

<https://vito.be/en/chemistry/new-value-chains/co2-to-chemicals>



Booth No. E1:

MefCO₂ (H2020 project)

i-deals – everis group

Av. Manoteras, 52, 28050 Madrid, Spain

Contact: Pablo Hortal – *Manager*

Mobile: +34 606 35 79 02

Phone: +34 91 749 00 00

pablo.ortal.farizo@everis.com

www.i-deals.es

Booth No. E2:

Sustainability Consult

Contact: Zoe Volioti

Business Development – Sustainability Consult

Phone: +32 (0)2 347 11 01

zv@sustainabilityconsult.com

www.sustainabilityconsult.com



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Partners



www.hdt-essen.de



www.bcn-consultants.com



www.clib2021.de



<http://co2chem.co.uk>



www.dib.org



<http://een.ec.europa.eu>



www.ibbnetzwerk-gmbh.com



www.ieaghg.org



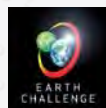
www.esf.org/matseec



www.kunststoffland-nrw.de



www.polycomply-hoechst.com



www.virginearth.com



www.scotproject.org



www.bio.org

Media Partners



www.bioplastics-magazine.com



www.b2bioworld.com



www.chemanager-online.com/en



www.chemical-weekly.com



<http://onlinelibrary.wiley.com>



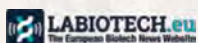
www.eurobiotech-news.com



www.goingpublic.de/lifesciences



www.greenchemicals-blog.com



www.labiotech.eu



www.bio-based.eu/iBIB



www.liebertpub.com



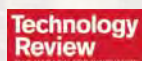
www.plasticker.de



www.sustainability-consult.com



www.plastixportal.co.za



www.heise.de/tr



www.bio-based.eu/news

<http://news.bio-based.eu>

» More than 15 years - more than 16,000 reports and news - more than 8,000 companies

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» Send us your press release in English or German - we will disseminate for free news@bio-based.eu

» Advertise your event or company to the bioeconomy community via bio-based news <http://news.bio-based.eu/or-your-banner>

» Up to 2,000 readers each day from more than 140 countries!

The screenshot shows the homepage of the Bio-based News website. The main content area features several news articles with headlines such as "Multi-talented - and made from shrimp shells", "Ein Multitalent aus Krabbenchalen", "The Role of Zeolite Catalysis in the Development of Bioplastics", "Just how environmentally friendly are biobased materials actually?", "Europe's circular bioeconomy: at make or break point?", "UCLA scores 6.5-million-gallon water savings", "Recyclingmaterial-Kollektion aus industriellen Baumwollabfällen", "Elektrolyseur - Der Strom gibt Gas", "Pharma setzt auf Biotech-Start-ups", "TOP 'Diamonds from the sky' approach turns CO₂ into valuable products", "Complete biosynthesis of opioids in yeast", "The Isobutene process successfully uses xylose, the 'wood sugar'", and "Researcher probes whether wood waste can help remediate mine tailings". The left sidebar contains logos for various organizations like TÜV Rheinland, DIN CERTCO, and bioplastics magazine. The right sidebar lists upcoming events such as the 4th Conference on CO₂, NWBC 2015, EFIB 2015, and the Sixth WPC Conference.

Reach your specific target group at "The Portal for Bio-based Economy and Industrial Biotechnology" - The perfect place for your own press release as well as for announcing an event! Bio-based News is growing into the central point of information for the international bio-based economy.

Get in contact with our editorial team! Send your press release to news@bio-based.eu
Michael Carus +++ Achim Raschka +++ Barbara Dommermuth +++ Marion Kupfer



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EnergieAgentur.NRW

The EnergyAgency.NRW works on behalf of the state government of North Rhine-Westphalia as an operative platform with broad expertise in the field of energy: from energy research, technical development, demonstration, market launch and energy consultancy to continuous vocational training. Many of its activities focus on energy efficiency and climate protection.

The Energy Agency.NRW was established in 1990 and operates now with around 120 employees from its locations in Düsseldorf, Gelsenkirchen and Wuppertal. It is funded by, among others, the European Regional Development Fund (ERDF). Over 3.300 companies and institutions are partners of the EnergyAgency.NRW, most of them are small and medium-sized enterprises. The network counts also 64 universities, 107 institutes and 94 associations.

The EnergyAgency.NRW manages the energy industry cluster 'EnergyRegion.NRW' and the cluster EnergyResearch.NRW 'CEF.NRW'. Furthermore, the EnergyAgency.NRW offers energy consulting services in the form of initial and contracting consultancy for companies and administrative bodies, as well as information and continuous training facilities for specialists and individuals. The portfolio also includes courses in user behavior, mediation services and state-wide campaigns as well as joint actions.

Cluster Management

On behalf of the NRW Environment and Climate Protection Ministry, the EnergyAgency.NRW with EnergyRegion.NRW is responsible for a powerful economic cluster for climate protection incorporating thirteen networks: biomass, fuel cells and hydrogen, carbon capture usage, energy efficiency in municipalities, energy efficiency in companies, geothermal energy, climate-friendly and energy-efficient construction, CHP/power plant technology, future fuels and drives, grids and storage systems, photovoltaics, hydropower and wind energy. On behalf of the NRW Economics Ministry the EnergyAgency.NRW is organising the 14th network "Energy/Mining Economy and Technology". In the spotlight: highly competitive co-operations to initiate innovative projects and products, to speed up their market readiness and to exhaust all economic potentials. This also includes providing support for companies from NRW in the domain of foreign trade.

The EnergyAgency launched the network "Future Fuels and Drives". The aim is to muster all the forces along the respective value chains in order to develop joint solutions for future forms of mobility. This also encompasses the development of new technologies and the testing of new business models.

www.energieagentur.nrw.de

Premium Partner

EnergieAgentur.NRW 

Roßstr. 92, 40476 Düsseldorf

Dr. Frank-Michael Baumann
Lothar Schneider

Chief Executive Officer

Dr. Frank Köster
*Manager Network Future
Fuels and Drives*

Phone: +49 209 167-2811

Mobile: +49 178 7138876

koester@energieagentur.nrw.de

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Silver Sponsor

**InfraServ GmbH & Co.
Knapsack KG** 

Chemical Park Knapsack
Industriestraße 300
50354 Hürth

Gordana Hofmann-Jovic

*Head of Process Development
and Engineering*

Phone: +49 (0)2233 48-6345

gordana.hofmann-jovic@infraserv-knapsack.de

Pierre Kramer

Head of Site Development

Phone: +49 (0)2233 48-6343

pierre.kramer@infraserv-knapsack.de

InfraServ KNAPSACK

Engineering and Construction by INFRA SERV KNAPSACK

The idea of producing chemical building blocks with the help of biotechnology is becoming more and more appealing to a majority of players in the chemical industry in Europe. The dynamic European market is the ideal basis for the commercialization of your bio-based chemicals due to the large amount of available renewable feedstock as well as a fast growing number of potential bio-based applications.

Process development

Your good product idea is a sound start. Yet to actually get this idea onto the market you need the appropriate production process. InfraServ Knapsack develops these processes for and with customers once the basic producibility of the product and its general specifications have been determined.

Individual solutions

Every product, every company and every site has its own requirements when it comes to processes and plants. Satisfying these requirements calls for customised planning and development processes at every stage. InfraServ Knapsack places particular emphasis on the engineering of individual plants – from process development and conceptual design to basic and detailed engineering, regardless of whether we just carry out sub-services or take over the general planning for every stage.

InfraServ Knapsack does not supply one-size-fits-all solutions. Instead, we adopt a flexible approach and gear ourselves towards the specific requirements of the current project stage – step-by-step.

We set a fundamental course early on in the planning process using process development and conceptual design. Thanks to a broad range of diverse engineering fields and an extensive selection of methods, we can guarantee the very highest degree of flexibility with regard to content.

Scale-up platform

The Chemiepark Knapsack near Cologne in Germany also offers companies a scale-up platform and access to know-how for bio-based production and integration into existing value-chains. The innovative capacity of the Chemiepark Knapsack, qualified skilled workers, solid infrastructure, plug & play services, as well as less bureaucracy and red tape all offer huge benefits for your company to commercialize your product.

www.infraserv-knapsack.de

Market study on Bio-based Building Blocks and Polymers in the World Capacities, Production and Applications: Status Quo and Trends towards 2020

Fast Growth Predicted for Bio-based Building Blocks and Polymers in the World – Production Capacity will triple towards 2020

The new comprehensive 500 page-market study and trend reports on “Bio-based Building Blocks and Polymers in the World – Capacities, Production and Applications: Status Quo and Trends Towards 2020” has been released by German nova-Institut GmbH. Authors are experts from the nova-Institute in cooperation with ten renowned international experts.

<http://bio-based.eu/markets>

Constant Growth of Bio-based Polymers is expected: Production capacity will triple from 5.1 million tonnes in 2013 to 17 million tonnes in 2020, representing a 2% share of polymer production in 2013 and 4% in 2020. Bio-based drop-in PET and the new polymers PLA and PHA show the fastest rates of market growth. The bio-based polymer turnover was about € 10 billion worldwide in 2013. Europe loses considerable shares in total production to Asia.

What makes this report unique?

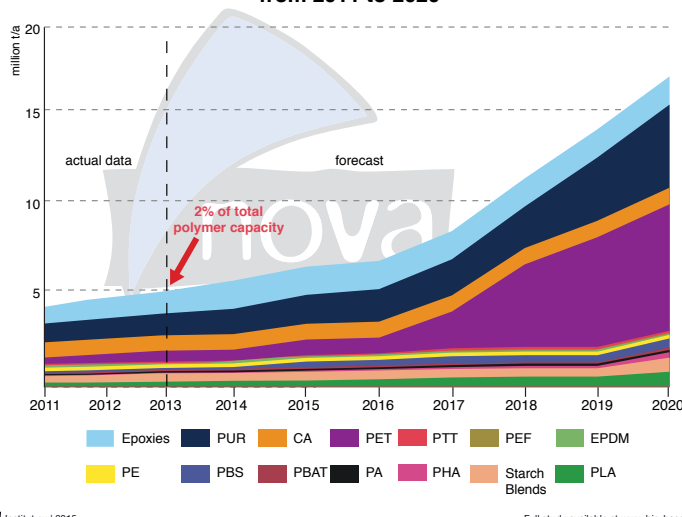
- The 500 page-market study contains over 200 tables and figures, 96 company profiles and 11 exclusive trend reports written by international experts.
- These market data on bio-based building blocks and polymers are the main source of the European Bioplastics market data.
- In addition to market data, the report offers a complete and in-depth overview of the bio-based economy, from policy to standards & norms, from brand strategies to environmental assessment and many more.
- A comprehensive short version (24 pages) is available for free at <http://bio-based.eu/markets>

To whom is the report addressed?

- The whole polymer value chain: agro-industry, feedstock suppliers, chemical industry (petro-based and bio-based), global consumer industries and brands owners
- Investors
- Associations and decision makers

Two years after the first market study on bio-based polymers was released, Germany's nova-Institute is publishing a complete update of the most comprehensive market study ever made. This update will expand the market study's range, including bio-based building blocks as precursor of bio-based polymers. The nova-Institute carried out this study in collaboration with renowned international experts from the field of bio-based building blocks and polymers. The study investigates every kind of bio-based polymer and, for the first time, several major building blocks produced around the world, while also examining in detail 112 companies that produce bio-based polymers.

Bio-based polymers: Evolution of worldwide production capacities from 2011 to 2020



Content of the full report

This 500 page-report presents the findings of nova-Institute's market study, which is made up of three parts: “market data”, “trend reports” and “company profiles” and contains over 200 tables and figures.

The “market data” section presents market data about total production capacities and the main application fields for selected bio-based polymers worldwide (status quo in 2013, trends and investments towards 2020). This part not only covers bio-based polymers, but also investigates the current bio-based building block platforms.

The “trend reports” section contains a total of eleven independent articles by leading

experts in the field of bio-based polymers. These trend reports cover in detail every important trend in the worldwide bio-based polymer market.

The final “company profiles” section includes 96 company profiles with specific data including locations, bio-based polymers, feedstocks and production capacities (actual data for 2011 and 2013 and forecasts for 2020). The profiles also encompass basic information on the companies (joint ventures, partnerships, technology and bio-based products). A company index by polymers, with list of acronyms, follows.

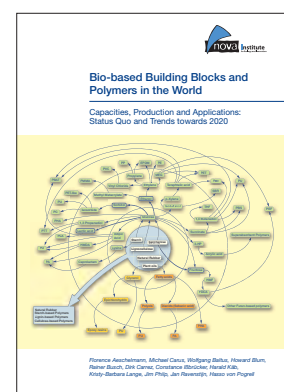
Order the full report

The full report can be ordered for 3,000 € plus VAT and the short version of the report can be downloaded for free at:
www.bio-based.eu/markets



Contact

Dipl.-Ing. Florence Aeschelmann
+49 (0) 22 33/48 14-48
florence.aeschelmann@nova-institut.de



MICROPLASTIC IN THE ENVIRONMENT

Sources, Impacts & Solutions

23 - 24 November 2015
Maternushaus, Cologne, Germany



Goals

- Identify **sources** of microplastics and quantify the amount ending up in nature
- Reveal **impacts** on marine ecosystems and human beings
- Propose **solutions** for current problems, such as prevention, recycling and substitution with biodegradable plastics & other materials

Confirmed speakers from

University of Plymouth (GB), Mepex Consult (NO), COWI (DK), HYDRA (DE/IT), TU Berlin (DE), University of Bayreuth (DE), BUND – Friends of the Earth (DE), nova-Institute (DE), Plastic Soup Foundation (NL), OWS (BE), Jan Ravenstijn Consulting (NL), University of Stuttgart (DE)

Scope

The event will provide plenty of opportunities for discussion between producers, consumers, scientists, environmental organisations, governmental agencies and other interested stakeholders.

+++ More than 200
participants are expected +++

www.microplastic-conference.eu



Your contact

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



nova-Institut GmbH
Chemiepark Knapsack
Industriestr. 300
50354 Huerth, Germany

