



EUROPEAN
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PROJECT LEAFLET

Risk-Based Management of Chemicals and Products in a Circular Economy at a Global Scale

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Coordination:

Prof. Bernd Bilitewski

Institute of Waste Management and
Contaminated Sites Treatment
Technische Universität Dresden
Pratzschwitzer Str. 15, 01796 Pirna, Germany
www.tu-dresden.de/fghhiaa

Contact:

iaa@mailbox.tu-dresden.de



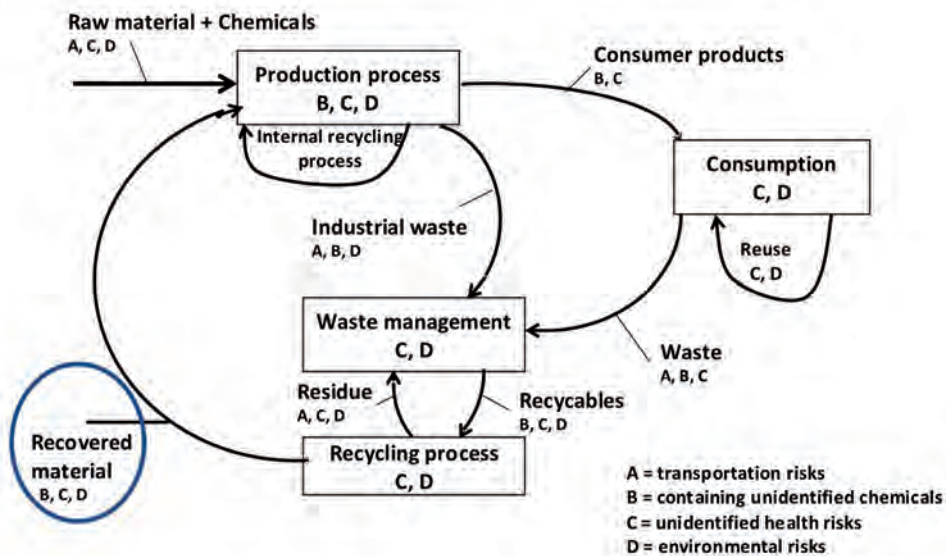
**TECHNISCHE
UNIVERSITÄT
DRESDEN**

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OBJECTIVES

The primary aim of **RISKCYCLE** is to identify future R&D needs required to establish a risk-based assessment methodology for chemicals and products while ensuring the development of new chemicals and product management pattern leading to minimized risks for health and the environment. Products undergo a recycling process and make their way into a recovered material with unpredictable and not foreseen health and safety problems. The project is focussing on consequences due to the behaviour of chemicals and their release during recycling of the six fractions: paper, electronics, leather, lubricants, plastics, textiles.

The coordination action (CA) **RISKCYCLE** is aimed to establish and co-ordinate a global network of European and international experts and stakeholders to define together future needs of R&D contributions for innovations in the risk-based management of chemicals and products in a circular economy of global scale leading to alternative strategies to animal tests and reduced health hazards.



www.wadef.com/projects/riskcycle



WORKPACKAGES



WORK PACKAGE TITLE	LEAD PARTICIPANT AND CONTACT DATA
Coordination and Management	TUD (Prof. Dr. Dr. Bernd Bilitewski) iaa@mailbox.tu-dresden.de
Capacity Building	TUD (Prof. Dr. Dr. Bernd Bilitewski) iaa@mailbox.tu-dresden.de
Fate and Behaviour of Chemicals	CSIC (Prof Dr. Damià Barceló) damia.barcelo@idaea.csic.es
Alternative Toxicity Testing for Additives	IRFMN (Dr. Emilio Benfenati) benfenati@marionegri.it
Risk Assessment Methodologies	UPC (Prof. Dr. Joaquim Casal) Joaquim.casal@upc.edu
Life Cycle Assessment	CML (Dr. Ester van der Voet) Voet@cml.leidenuniv.nl
Socio-Economic Aspects	IVL (Dr. Tomas Rydberg) tomas.rydberg@ivl.se
Global Strategy for Risk Based Management	TUD (Prof. Dr. Dr. Bernd Bilitewski) iaa@mailbox.tu-dresden.de



WORKSHOPS

Under direction of Prof. Bernd Bilitewski (Technische Universität Dresden) and Prof. Damiá Barceló (Spanish National Research Council (CSIC), Barcelona) over the past three years, four international workshops have been organized. Among others the main aim of the workshops was to give the 16 project partners and the representatives from the Advisory Board of the project (e.g. OECD, UNEP, SAICM) the possibility to discuss country-specific problems and research results together with international and also local politicians and representatives. The outcomes of these workshops have been included into the main tasks of the single work packages of **RISKCYCLE** and in the created reports and publications.



The first two workshops were held in May 2010 in **Hanoi (Vietnam)** and in November 2010 in **Shenyang (China)**, with 70 – 100 participants each.



The final two international workshops were held in May 2011 in **Rio de Janeiro (Brazil)** and in October 2011 in **New Delhi (India)**. Due to the organization by each of the international partners, an interesting mix of international speakers and topics could be presented.



Research results, which are usually written and published in non-European languages and thus difficult to obtain, have been made publicly available to a broad European audience and provided versatile and valuable input to the project.

More information about the 4 workshops at the web page: www.wadef.com

FINAL CONFERENCE



The final **RISKCYCLE** conference, titled “Risk-Based Management of Chemicals and Products in a circular economy at a global scale”, was held on 8 and 9 May 2012 in Dresden, Germany. The speakers summarized the projects achievements and identified the key elements for future risk management framework applied to the requirements of a circular economy of global scale. The main topics for each session were as follows:

- Flow and emissions of additives - from production to reuse, recycling and waste for the chosen industry sectors
- Fate and behavior of chemical additives in recycling products
- Alternative toxicity testing for additives in products to reduce animal test in line with the objectives of the REACH directive
- Risk assessment methodologies and mitigation strategies for human health and environment related to additives
- Importance of additives in life cycle assessment of textiles, electronics, plastics, leather, paper and lubricants
- Bridging research needs with policy in the field of Risk-Based Management of Chemicals and Products

The conference was attended by some 60 scientist from Europe and from abroad involving the scientific disciplines necessary to deal with the complexity of the issue. Further-more, representatives from UNEP, OECD, EC and national administrations were present.

The **PRESENTATIONS** can be found here:
<http://faa-tagungen-dresden.de/en/riskcycle/download/>

The **CONFERENCE PROCEEDINGS** of the final **RISKCYCLE** Conference in Dresden at a price of 30 € plus postage and packaging will be available on purchase. Write an e-mail to:
forum@mailbox.tu-dresden.de



RESULTS

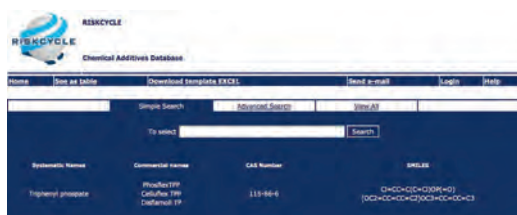
RISKCYCLE is not only focusing on detailed investigation of fate and behaviour of additives in six different sectors but also on an identification of current research needs and gaps in this research area. Some of the identified needs and gaps are listed below:

- ➔ Lack of data about chemicals in products
- ➔ Risk of chemical mixtures in products
- ➔ Release of chemicals from materials and goods
- ➔ Scarce information on characteristics related to the use of chemicals
- ➔ Associated uncertainty is missing for in vivo experiments
- ➔ Necessity to increase the acceptability on alternative methods
- ➔ Missing common database for additives in WEEE
- ➔ Limited specific data about informal recycling

Future activities should address these research gaps to continue the progress towards a risk-based management of chemicals and products at a global scale.

RISKCYCLE DATABASE (Open Access)

www.idaea.csic.es/riskcycle/publica/RCCP000_Main.php

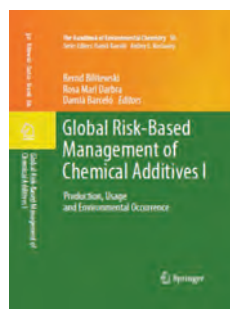


RISKCYCLE Database aims to be a tool to assist in understanding and organizing information related to chemical additives including their physico-chemical properties, toxicological data, and also information about production and economic aspects.

RISKCYCLE BOOKS

For each of the considered six fractions a list with five main additives, which have been studied in detail, has been compiled. Using these selected additives, exemplary investigations have been carried out within the single work packages, such as Life cycle assessment of additives in the plastics and paper industries, or the use of different risk assessment methodologies to investigate the effects of using these additives and their behavior in various recycling processes. The results of these investigations and the first project outcomes are published in the book "Global Risk-Based Management of Chemical Additives I (Production, Usage and Environmental Occurrence)".

Additional results of the second project period will be published at the end of 2012 as part of the book, "Chemical Additives in selected industrial sectors at a global scale - Volume II (risk-based assessment and management strategies)".



EXAMPLES OF RECENT PUBLICATIONS

Bilitewski, B.: **The Circular Economy and its Risks**; Waste Management, International Journal of Integrated Waste Management, Science & Technology, Elsevier Science Ltd., New York, USA, Volume 32 (2012), p. 1-2

Bilitewski, B., Zehm, A., Grundmann, V.: **Risk-based management of chemicals and products in a circular economy at a global scale**, Environmental Sciences Europe, not published yet

V. Grundmann, B. Bilitewski: **Environmental and health risks of chemical additives and recycling materials**. In: Proceedings of SETAC Europe 21st Annual Meeting, Milano, 16th May 2011

B. Bilitewski, V. Grundmann, D. Barceló: **Environmental and health risks of chemical additives and recycling materials**. In: Proceedings SARDINIA 2011: Thirteenth International Waste Management and Landfill Symposium, Sardinia 2011, CD-Version, Sardinia, Italy, 03.-07.10.2011

Bilitewski, B.; Barceló, D.; Darbra, R.M.; v. d. Voet, E.; Belhaj, M.; Benfenati, E.; Ginebreda, A.; Grundmann, V.: **International workshop on safety assessment of consumer goods coming from recovered materials in a global scale perspective**; Journal of Vietnamese Environment. 2012, Vol. 2, No. 1, p. 20-26

Bilitewski, B.: **Safety assessment of consumer goods of recovered material in the perspective of circular economy at global scale – a new challenge**. Proceedings SARDINIA 2009 Symposium: "XII International Waste Management and Landfill Symposium", S. Margherita di Pula (Cagliari), Sardinien, Italien, 05.-09.10.2009, p. 3-4

Bilitewski, B.: **Circular Economy: Balancing Development and Environmental Protection**. Proceedings 2nd International Conference on Asian-European Environmental Technology and Knowledge Transfer, Hefei University (China), Hefei 5-6 June 2008, p. 1-7

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Grundmann, V.: **Risk-based Management of chemicals and products in a circular economy at a global scale**. Proceedings to the Third International Symposium on Energy from Biomass and Waste. Venice 8th – 11th November 2010

Benfenati, E. **Relazione ERICA – Campi di applicazione e prospettive**. Settimana Medio Ambiente 2011. RISK ASSESSMENT. Metodi di valutazione per l'ambiente e per l'uomo. Milano, 2011.

Van der Voet, E. Grundmann, V. (2010). **Risk-based management of chemicals and products in a circular economy at a global scale – RISKCYCLE**. The 3^o International Conference on Eco-Efficiency. 9-11 June 2010, Egmond aan Zee, Netherlands.

Àgueda, A., Ocampo-Duque, W., Darbra, R.M. **Review of fuzzy methods and applications in environmental quality assessment**. Ecological Indicators (sent).

Andersson, H., Westerdahl, J., Rahmberg, M., Rydberg, T. **Economy wide impacts of plastic additives assessed using USEtox**. Int J LCA (sent).

Boriani, E., Mariani, A., Baderna, D., Moretti, C., Lodi, M. Benfenati, E.(2010). **ERICA: A multiparametric toxicological risk index for the assessment of environmental healthiness**. Environmental International, 36, 665-674.

D. Baderna, N. Golbamaki, A. Lombardo, F. Rotondo, E. Boriani, A. Guerrini, M.G. Mascolo, M. Lodi, M. Vaccari, A. Colacci, S. Grilli and E. Benfenati: **Evaluation of carcinogenic potential of perfluorinated compounds using *in vitro* and *in silico* alternative approaches**; Proceedings of SETAC Europe 22nd Annual Meeting, Berlin, 20 - 24th May 2012

H. Tien, H. Tien, S. Heise, N. Cuciu, E. Capri, M. Trevisan, M. Schuhmacher, M. Nadal, J. Rovira, X Segui, J. Casal, R.M. Darbra: **Combination of SFA and multi-media fate modeling to assess the consequences of global trade and informal recycling of WEEE in China**; Proceedings of SETAC Europe 22nd Annual Meeting, Berlin, 20 - 24th May 2012

PARTICIPATING ORGANIZATIONS



Technische Universität Dresden
Institute of Waste Management
and Contaminated Site Treatment



Spanish Council for Scientific Research
Chemical and Environmental
Research Institute



Istituto di Ricerche Farmacologiche
Mario Negri



Universitat Politècnica de Catalunya
Centre for Studies on Technological Risk



Universiteit Leiden
Institute of Environmental Sciences



Swedish Environmental Research Institute



Danmarks Techniske Universitet
Department of Management Engineering



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Environmental Chemistry



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Environmental Health



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Pesquisas e Estudos Tecnológicos



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Department of Chemistry



The Energy and Resources Institute



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