

bifa contributes expertise to Bavaria's recycling management strategy

Participation in stakeholder dialogues provides impetus for specific projects to conserve resources in Bavaria



On 23 July 2024, the Bavarian State Government approved the development of a Bavarian Circular Economy Strategy (BayKWS) – a significant step towards a sustainable and resource-efficient economic system in the Free State.

The aim of the strategy is to provide clear guidance for companies, promote resource efficiency and lay the foundations for a sustainable economy. The strategy process is being coordinated by the Bavarian Resource Efficiency Centre (REZ).

The bifa Environmental Institute is closely involved in the development of the BayKWS. As an independent scientific institution with many years of expertise in resource efficiency, material flow analyses and sustainable transformation, bifa was invited to all stakeholder dialogues that took place in various key sectors at the beginning of 2025. The focus was on the six central fields of action: mobility, metals & mechanical engineering, construction & infrastructure, electrical engineering & ICT, plastics & packaging, textiles & clothing, and organic raw materials/biomass.



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22nd VDI Technical Conference



>> During the dialogue events, representatives from industry, science and associations identified specific challenges and discussed possible solutions and measures to be incorporated into the BayKWS.

The participation of the bifa Environmental Institute proved to be particularly effective in this regard.

In addition to the exchange of expertise, valuable contacts were made and initial project ideas were initiated. In the 'Textiles & Clothing' sector, for example, the cooperation partners TH Augsburg, Recycling Atelier Augsburg and the Bavarian Ministry of the Environment (StMUV)

jointly developed ideas and concrete approaches for new measures to improve the recycling of textiles and to support existing measures.

A further outcome result of the process is the establishment of a collaborative relationship with BayPapier in the field of 'Plastics & Packaging'. The Association of the Bavarian Paper, Cardboard and Plastics Processing Industry and the Association of Bavarian Paper Mills operate under the umbrella name BayPapier. Collectively, they are dedicated to regional industrial production and the provision of sustainable, resource-saving paper and packaging products.

The collaboration with BayPapier focuses on identification of challenges and the formulation of specific measures and recommendations for action to ensure the long-term recycling of paper materials. This will enhance both the practical and regulatory aspects.

bifa contributes to the strategy process, leveraging its extensive experience to actively influence the transformation to a circular economy in Bavaria.

Contact: Prof. Dr. Nadine Warkotsch
nwarkotsch@bifa.de



FuturePV Workshop: Future-proof perovskite PV

Lecture on the eco-design of innovative photovoltaic modules

bifa was represented at the FuturePV Workshop, which took place from 20 to 22 May 2025 at the University of Cyprus (in Nicosia). At this joint event involving 15 current European funding projects, over 70 experts from across Europe discussed how perovskite PV technology can be scaled up and, made more durable and sustainable.

Initial results from the SMARTLINE PV project

Dr Matthias Hämmer (bifa) presented the initial results in his presentation 'Eco-design guidelines for tin-based perovskite PV modules'. The EU-funded research project is further developing perovskite photovoltaic technology. The project is developing a tin-perovskite-based solar cell technology as an alternative to potentially environmentally hazardous lead-containing perovskite photovoltaic modules. In addition, the focus is on efficient roll-to-roll (R2R) manufacturing, reduced costs and flexible modules with selectable colours. Under the leadership of bifa, the project is implementing eco-design at all levels, including the solar cell and in all product components, with a focus on design for recycling.

With this goal in mind, bifa, in collaboration with project partner CEA (France), developed 17 specific 'Ecodesign Guidelines' at the start of the project, which Dr Hämmer presented to a wider audience of experts there. The proposals include the substitution of critical materials, reduction of material complexity, the use of 'greener' >>



>> solvents and recycling-friendly encapsulation materials. Another focus was on the differences in the eco-design of lead- and tin-based perovskite solar cells. Although the former are more technologically advanced, they pose a greater challenge in eco-design

due to toxicological reasons, especially when compared to the photovoltaic modules developed in the SMART-LINE-PV project.

Ansprechpartner: Dr. Matthias Hämmer
mhaemmer@bifa.de

New approaches to climate communication

Development of a concept for sustainable climate adaptation and natural climate protection

Good communication opens doors. That is why the recently launched KlimKomHub research project is rethinking climate communication: close to people, positively oriented and locally anchored.

The terms climate change, climate adaptation and climate protection are omnipresent. For many people, however, they sound abstract and distant from everyday life, or even negative. Future projects based on these terms can be met with scepticism or rejection. However, a liveable future can only be achieved with societal support.

Start of the three-year research project

The aim is to develop communication formats that go beyond providing information, promote understanding,

highlight concrete opportunities for action at the local level, strengthen social engagement and advance future projects – together, locally and positively.

To this end, concrete projects will receive a communicative boost in two model regions: in the city of Zwickau, with a focus on climate-resilient urban development, and in the Allgäu region, with a focus on cross-sector projects at the interface between agriculture, forestry and tourism. Existing narratives, concerns, wishes and visions for the future will be considered to develop effective communication strategies.

Contact: Dr. Wolfram Dietz
wdietz@bifa.de



Collaboration between bifa and Recycling Atelier Augsburg

Joint projects provide impetus for the resource-efficient use of old and new textiles

The bifa Environmental Institute works closely with Recycling Atelier Augsburg, a joint initiative of the Augsburg University of Applied Sciences and the ITA. The model factory offers ideal conditions for practical research in the field of mechanical recycling of used textiles.

The aim of the collaboration is to develop practical solutions for the resource-efficient handling of old and new textiles – a key contribution to the implementation of Bavaria's circular economy strategy.

In April 2025, the Recycling Atelier became a meeting place for key players

In addition to the Bavarian Ministry of the Environment (StMUV) and the REZ, representatives of the GRS Batterien Foundation, the THA and the bifa Environmental Institute met for an intensive exchange on collection structures, extended producer responsibility (EPR) and general future areas of action and cooperation. Live research on the machines and lively discussions made the



visit an inspiring experience for everyone involved. bifa is also actively contributing its expertise to this process as a partner of the DATI-pilot innovation community 'Circular Textiles'. A visionary project to prevent textile waste is currently in preparation.

Contact: Prof. Dr. Nadine Warkotsch
nwarkotsch@bifa.de

Making hydrogen sustainable – bifa strengthens environmental perspective in advisory board

Meeting of the Regional Advisory Council on Hydrogen at the bifa Environmental Institute

bifa is a member of the Regional Hydrogen Advisory Board. This board was initiated in 2021 and promotes and coordinates all matters relating to hydrogen. It drives the region's development into a hydrogen innovation region and supports companies in the implementation of projects. The interdisciplinary group meets monthly.



On 5 June 2025, the bifa Environmental Institute hosted the meeting. The agenda included reports from the partners and the Hydrogen Coordination Office, including planned activities for Hydrogen Week and preparations for the 4th Regional Hydrogen Future Conference, which is expected to take place in February 2026. At the end of the meeting, the advisory board was given a comprehensive insight into the institute's diverse activities, laboratories and technical centre.

bifa is contributing its many years of expertise in life cycle assessments, material flow analyses and sustainable energy infrastructure to this process. The focus is on evaluating the environmental impact of the entire hydrogen value chain. In this way, bifa strengthens the environmental orientation of Bavarian hydrogen policy.

Contact: Prof. Dr. Nadine Warkotsch
nwarkotsch@bifa.de

Model for predicting high-temperature chlorine corrosion in waste incineration plants

22nd VDI Conference on Combustion and Boilers – Deposits and Corrosion in Large Combustion Plants

Together with Dr.-Ing. Warnecke (GKS Gemeinschaftskraftwerk Schweinfurt GmbH), Dr. Hämmer (bifa) presented a mathematical-physical model for calculating and predicting steady-state high-temperature chlorine corrosion of evaporator and superheater tubes in power plants using alternative fuels at this year's VDI conference.

High-temperature chlorine corrosion is one of the main limiting factors for the service life and operating temperatures of power plants using alternative fuels such as household waste, substitute fuels or biomass. Complex heat extraction systems are present in the exhaust gas

stream, which are exposed to corrosive flue gases and are therefore subject to severe corrosion.

In thermal power plants, increasing the pressure and temperature of the steam results in higher efficiency and thus a reduction in specific CO₂ emissions. However, as the relevant performance temperatures increase, the corrosive attack increases exponentially. Corrosion results in damage to the evaporator or superheater tubes and thus in limited operating and service life and, in the worst case, unplanned downtime.

Contact: Dr. Matthias Hämmer
mhaemmer@bifa.de

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EVENT

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editorial office:
Anita Gottlieb
phone +49 821 7000-229
presse@bifa.de

V.i.S.d.P.:
Management
Prof. Dr. Nadine Warkotsch,
Thomas Weber

phone +49 821 7000-0
fax +49 821 7000-100
solutions@bifa.de
www.bifa.de

bifa Umweltinstitut GmbH
Am Mittlere Moos 46
86167 Augsburg

Fotos: Titel: SMUV; Titel und S. 3: THA; alle weiteren: bifa Umweltinstitut GmbH