

From organic waste to biological goods

The biowaste industry in transition

At the time bifa was founded, waste management was changing. Waste should no longer just be „disposed of“ safely. The aim was to „promote the circular economy in order to conserve natural resources“ (KrW-/ AbfG, 1994). The prerequisite was the separate collection of different fractions of municipal waste that had previously been disposed of together as household waste.

Environmental hygiene issues

The conversion phase was marked by intensive discussions among the public and expert committees about hygienic risks in waste collection, composting and the use of compost. The focus was primarily on hygienic reservations about the collection and treatment of „organic waste“ in composting plants. In various joint research projects and studies, bifa has contributed to the development of the technical basis for low-risk biowaste recycling. Aspects of occupational health and safety, emissions of germs and toxins from treatment plants, and controls of the effectiveness of hygienisation processes were considered.

Biodegradability and recyclability of waste fractions

To this day, the expert discussion continues as to whether biowaste treatment plants are allowed to recycle products made of biodegradable materials and/or bioplastics in addition to natural biomasses and food residues, and whether they can do so. Initially, biowaste was almost exclusively composted. A pilot project accompanied by bifa showed that biowaste and organic commercial waste can also be used for the production of biogas with high process stability. In the following years, various biowastes and other waste fractions were tested for their biogas yields. The data are an important basis for plant planners and operators. A high quality of the composts and fermentation products ensures the circular economy for



Biodegradable bag ensures hygiene in organic waste collection

biomasses. Biotests were therefore used to test different biogenic residues for undesirable effects. The methods are also suitable for evaluating the inputs of novel products (such as nanomaterials).

Comprehensive life cycle assessment evaluations by bifa have confirmed that the proper separate collection and recycling of „biowaste“ is an ecologically valuable component of the circular economy.

The environmental-hygienic, -toxicological and -biotechnological methodological knowledge gained from the complex issue of biowaste is used for many other environmental technology tasks. Novel – mostly molecular biological – methods offer the potential for future-oriented findings.

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BRIEFLY INFORMED

EVENTS

4 – 9 October 2021:

eREC – Digital Recycling Expo and Conference for Circular Economy and Waste Management

bifa participates in eREC, the digital trade fair for the recycling industry. It offers a virtual platform that guarantees national and international exchange between companies, customers and associations.

20 – 21 October 2021:

Kommunale 2021 – 12th FEDERAL FAIR AND CONGRESS, Nürnberg, Trade Fair

At our stand, we will present our offers and practical examples on the topics of waste, energy and climate adaptation.

We are looking forward to your visit!

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Persistence

30 years of bifa Umweltinstitut GmbH

In the 1986 Waste Act, the hierarchy-rule“ (avoid-reduce-recycle) was codified. Growing mountains of waste nevertheless remained a problem, but no one wanted new landfills. Thus, in 1991, a referendum was held in Bavaria between the „Better Waste Concept“ of a citizens' initiative and the state government's draft for a „Bavarian Waste and Contaminated Sites Act“, which narrowly prevailed.

From now on, waste was supposed to be mainly incinerated. Plant capacities had to be created for this purpose. But waste incineration plants did not have a good reputation. They were apostrophised – not unjustifiably at the time with a view to the past – as „dioxin slingshots“. Despite massively tightened emission limits as early as 1990, there was great resistance to such plants.

More than 1,500 completed projects

In this field of tension, the state government, together with the Chamber of Industry and Commerce for Augsburg and Swabia and the City of Augsburg, founded the „Bayerische Institut für Abfallforschung GmbH (Bifa)“ in 1991. The first bifa-projects focused on thermal and biological waste treatment. The world's first project to investigate the immission situation around a waste incineration plant before and up to 10 years after commissioning had a major impact – and no negative influence was found.



Today, we at bifa hardly talk about waste management any more, but about a circular economy that is closely intertwined with climate change and resource scarcity. Whereas in the 1990s the „environmental compartments“ water – air – soil were still largely considered separately, today we have the „system in view“. In the first report of the IPCC it was still said that „there is little empirical evidence of human-induced climate change“. Today, things are different, and the 1.5 degree target is only achievable with significantly decreasing resource intensity and strongly increasing efficiency. We are not running out of work. bifa's „founding generation“ is approaching retirement, but our young employees are enthusiastically taking over, and so I am firmly convinced that bifa has many more successful years ahead of it.

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Climate protection and climate adaptation

Climate protection concerns everyone – climate change affects everyone

The importance of climate protection and climate adaptation will continue to grow – also for bifa. The year after bifa was founded, the „United Nations Conference on Environment and Development“ took place in Rio de Janeiro in 1992. 154 states signed the Framework Convention on Climate Change. At the latest, climate change, which was initially mainly discussed scientifically, became a politically relevant issue. Since then, the pressure to act has been growing. Today, climate protection is a highly explosive issue.

At bifa, climate protection has always been an important part of life cycle assessment and the target of development work. From 2003 onwards, we carried out the first projects that focused on climate protection measures – among others in the areas of waste management, trade,

commerce, services and industry. bifa has been involved in the development of municipal climate protection concepts and the climate protection effects of technical innovations. More recently, bifa's climate protection offering has been expanded to include the important module „Sustainable electricity and heat supply“.

Unfortunately, societal action as a whole remained far too hesitant. It became increasingly clear that unavoidable consequences of climate change must be expected.

Climate adaptation: bifa as a pioneer

Climate adaptation, therefore also soon proved to be indispensable. bifa became a pioneer in research and consulting in this field. On behalf of the Bavarian State Ministry for the Environment and Consumer Protection and the Federal Ministry for the Environment, among others, we have prepared studies on how transport companies, the energy industry and tourism are affected by the consequences of climate change. We have supported municipalities in developing climate adaptation concepts and heat action plans. More recently, we have worked on climate adaptation projects in health resorts and spas, in rail transport and currently in a carpentry company.

The importance of climate protection and climate adaptation will continue to grow – also for bifa.

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About energy efficiency and renewable energies

Advancing climate protection with expertise and commitment

From the finite nature of resources, which was one of the themes of the 1972 report „The Limits to Growth“ by the Club of Rome, to various effects of environmental pollution, such as the forest dieback of the 1980s, the focus of environmental protection challenges has increasingly shifted to climate change.

Limiting the greenhouse effect in the earth's atmosphere must be at the forefront of responsible shaping of the future. bifa has been contributing to this since the 1990s by initiating and working on projects in the field of energy efficiency and renewable energies. Focal points and examples of the work are:



>> The heat network projects with waste heat utilisation that we initiated in Meitingen and Weißenhorn in 2015 and have supported to this day, are proving themselves in operation, minimising climate gas emissions and continuing to grow. bifa created numerous other heat network concepts and supported their implementation.

Municipal energy concepts

Bavarian funding for energy utilisation plans has existed for a long time. bifa participated in their conception and prepared numerous studies for municipalities and districts, which were and are the starting point for targeted municipal climate protection action.

Heat and power interconnection projects

Together with the community of Fuchstal and the engineering firm Sing, bifa designed a pioneering project with heat and electricity storage for a regenerative municipal energy supply. bifa is supporting its implementation un-

til 2022. Numerous other concepts for municipal energy supply and interconnection projects were developed.

Hydrogen

bifa provides support in the planning of a regional hydrogen economy. In addition, bifa integrates energy and waste management objectives with the current studies „Potentials of thermochemical hydrogen production from commercial waste“ and „Potentials of sector coupling at waste treatment plants“.

bifa is ready to continue its high level of expertise and energetic commitment to the challenges of climate protection and to a liveable future.

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From waste management to the circular economy

Circular economy is a constant challenge

Waste management is undergoing a dynamic transformation away from pure „disposal and detoxification“ towards a sustainable, resource-conserving circular economy.

In addition to modern approaches to waste avoidance and recycling-friendly product designs, we are now also concerned with aspects such as the substitution of rare, valuable or even toxic materials. It is about the avoidance of critical raw materials and the consideration of social and ethical values in the supply chains as well as reparability, useful life and value-preserving and energy-saving recycling in closed cycles in Europe to secure scarce raw materials via secondary materials.

Green Manufacturing

bifa's current research focuses on optimising the value chain and the effects of various, innovative new production and recycling systems of photovoltaic products in several independent projects.

In the BMWi-funded joint project Green Manufacturing (FKZ: 03EE1048C), for example, bifa is working on the optimisation of the material flow, value-preserving recycling management and associated environmental aspects from the solar cell to the recycling of the PV module.



Feasibility analysis for the introduction of the organic waste bin in the collection system for the district of Rosenheim.

In this project, we determine the biowaste potential in the residual waste bin. An ecological comparison of different collection and recycling scenarios using modelling software, a profitability analysis with regard to investment and operating costs as well as waste charges and the consideration of technical issues related to organic waste collection, are also part of the project.

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