

Assessment of Biowaste Collection and Treatment

Integrated deliberation supports municipal decision-makers



Our institute increasingly deals with issues concerning aspects of assessing biowaste collection and treatment in German local authorities.

In a feasibility study for the rural district Landkreis Rosenheim, we considered how large the effort is and what are the benefits produced by changing over to a collection system for the contents of biowaste bins? The collection and utilisation of the organic waste was examined with regard to environmental, economic and technical conceptual aspects. The feasibility of a central biowaste fermentation plant was considered on behalf of the waste management facilities of the City of Ulm and other urban and rural districts

in the region of Donau-Iller-Oberschwaben, which extends across the border between two different German states.

The combination of different methods leads to success

When we undertake such studies, we use all kinds of different current methods for assessing the conditions and concepts of individual waste management systems. The biowaste potential in residual waste or the foreign matter content in biowaste is determined, for example, with the help of sorting analyses according to the sorting guidelines of Saxony, or the Federal Compost Quality Association (Bundesgütegemeinschaft Kompost). In this way, optimisation measures can be developed for the >>

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Drawing up a study



>> collection of biowaste or composting and biowaste fermentation plants can be dimensioned.

In order to determine the suitability of biowaste for fermentation, since its composition often varies regionally, biowaste is characterised in accordance with VDI 4630 and its biogas potential is established. It is often necessary to integrate a spatial analysis in feasibility studies of biowaste treatment plants. To do this, we use geoinformation system software, such as ArcGIS-Pro or QGIS models. This enables



to evaluate central influencing factors (such as logistics or energy/heat feed-in) both separately and in parallel.

An important part of the assessment is the economic consideration

To determine the environmental effect of waste management systems, we conduct life cycle assessments based on ISO 14040 and 14044. With these, we can determine the improvement potential in the waste collection and treatment. By considering scenarios, it is possible to assess changes in the waste management environmentally. One example worth mentioning is our support for a planned diversion of material flows due to new statutory requirements, in the construction of new treatment plants or system changeovers.

We use business management assessment methods, for example, the total cost of ownership or life cycle costing to represent the economic feasibility of a biowaste treatment plant. This makes it possible to determine investment and operating costs before advancing with elaborate planning projects. We work with calculation tools that we have further developed and optimised in-house, with which changes in the rates and charges structure of a local authority can also be forecast with high accuracy.

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Waste Avoidance: A “Vision Possible”

A vision, measures and a network for waste avoidance

The primary objective of the circular economy, in accordance with the waste hierarchy, is to avoid waste in order to conserve resources and to protect people and the environment. To strengthen waste avoidance in Baden-Württemberg, the Ministry of the Environment, Climate Protection and the Energy Sector Baden-Württemberg engaged bifa to develop waste avoidance strategies.

Working with representatives of municipalities, companies, associations and initiatives, workshops and discussion events were held in which a vision for waste avoidance in Baden-Württemberg was developed. This was supplemented by fact sheets, in which selected waste avoidance measures are described.

In addition, a catalogue with more than 200 measures was compiled, which can be used to realise the vision. Because in general, it is not individual waste avoidance measures that produce success, they frequently develop their effect only with their diversity and through synergies with others.

The brochure, “Vision Possible – Strategies for waste avoidance today and tomorrow” is planned for publication by 30 April 2023.



Strategies for waste avoidance today and tomorrow

The “Vision Possible” event was held on 8 March 2023 in Stuttgart. Dr Andre Baumann, State Secretary in the Ministry of the Environment, Climate Protection and the Energy Sector Baden-Württemberg, welcomed the some 100 participants. Dr-Ing Fatah Naji opened with the keynote speech „By when will we have devoured the Earth”? and sensitised the audience to the finite nature of our resources. Prof Dr-Ing Carla Cimatoribus, Esslingen >>

>> University, then presented basic conditions, with which the circular economy of tomorrow can be created. Numerous talks given by speakers from science and practice informed on the topic of waste avoidance. Alongside positive best practice examples of the AWB Bodenseekreis (Lake Constance District), the Consumer Advice Centre (Verbraucherzentrale) of Baden-Württemberg also presented negative examples. The RCBS repair café stimulated an exchange of ideas. The open panel discussion showed how important the topic of waste avoidance is for our society. One visionary idea, which has already

been implemented by the Regierungspräsidium Freiburg, is the library of things: Because less is more!

But a closing event does not mean the end: Work continues with the "Network for waste avoidance", which has been brought into being by the Ministry of the Environment, Climate Protection and the Energy Sector Baden-Württemberg. If you would like to become part of the network, please contact us.

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Sustainability concept for HEINZ Entsorgung GmbH

We support companies with the specification of their SDGs

The HEINZ company in Moosburg transports waste, sorts used packaging and develops disposal concepts. Sustainable entrepreneurship is already an important concern for HEINZ. To intensify its own efforts still further, HEINZ has worked with us to produce a sustainability programme. Together, the sustainability goals were identified and specific measures for achieving them were formulated.

Sustainable development goals

The sustainable development goals (SDGs) provide the framework for the HEINZ sustainability concept. These sustainability goals describe the central global challenges of our time: Ending extreme poverty; fighting inequalities and injustices.

The goals and measures of the sustainability concept were drawn up together by the persons responsible in the relevant operating areas. We moderated the process and provided content ideas. During three workshops, the central contents were worked up, the courses were set and decisions were made. At the end, a programme now exists to which HEINZ has committed itself. In future, the



sustainability efforts will concentrate on the three areas of climate and energy, resource conservation and social responsibility, health and education.

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BRIEFLY INFORMED

EVENTS

22 July 2023: Rotary Day of the Climate, Kurhaus Göggingen

Speakers will approach the challenges of climate change from all kinds of different perspectives.

bifa will be represented by:

Prof Dr-Ing Wolfgang Rommel (keynote speaker) and Dr Kerstin Dressel

NEW PUBLICATION

Anticipated April 2023: Classification of household waste incineration slag in the waste register based on the hazard-relevant properties HP1-HP15.

Practical guidelines of the IGAM and ITAD e.V. associations, Düsseldorf (update)

Potential of sector coupling for waste treatment plants

Drawing up a study on behalf of the German Environment Agency

Waste incineration and biowaste fermentation plants contribute to the energy supply with electricity, heat and biogas. We analysed how this contribution should be adapted to future needs and which technology paths can be used to reduce greenhouse gas emissions.

The environmental and economic assessment of the approaches in sector coupling, CCU and CCS, produces a differentiated picture: The electricity-based production of hydrogen is not advantageous for climate protection until the share of renewable energy in the electricity sector increases significantly – only then can the reduced electricity grid feed-in of the plants be cushioned by renewable electricity sources in the grid.

Improving climate protection and economic efficiency

Flexible, electricity price-guided running of the electrolyser improves climate protection and economic efficiency. Methane or methanol production under the basic conditions set proves to be economically disadvantageous. To be useful for climate protection, an increased share of renewable energy in the electricity sector is also necessary here. CCS in waste incineration plants opens up a significant contribution to greenhouse reduction arithmetically and



enables negative emissions. The changeover from electricity and heat generation to biomethane feed-in was examined for biowaste fermentation plants.

The findings must be viewed in light of the current discourse on CCS and CCU and the Federal Government's announced development of a carbon management strategy. Our comprehensive study will likely be published as a UBA text in mid-2023.

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Textile waste – energetic recovery or material recycling?

Less than 1 % of textile waste worldwide is recycled

Together with the ITA Augsburg, we examined which basic conditions must exist so that the utilisation of textile waste can also succeed in Bavaria.



The available methods for material recycling currently only indicate a potential for economic and industrial implementation in mechanical recycling. However, it is to be expected that the quantity of textile waste that cannot be recycled as material will increase due to "fast fashion". High-quality utilisation of this textile waste is therefore required in the coming years.

Utilising the hydrogen potential of textile waste in Bavaria!?

The hydrogen potential of textile waste that cannot be recycled determined for Bavaria is around 70,000 t/a. This produces a hydrogen potential of around 5,600 t/a (around 0.2 TWh) with a value of approx. 14 million €/a. Related to the forecast hydrogen demand in Bavaria of 10 TWh/a from 2030, the textile gasification can therefore only make a small contribution.

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