

Food waste – monitoring and prevention measures

A serious problem



According to Germany's Federal Statistical Office (Destatis), the total quantity of food waste produced along the value chain in Germany in 2020 was approx. 11 million tonnes fresh weight. The largest share of 59 % was produced by private households. Around 55 % of the total quantity is considered to be theoretically avoidable food waste. This quantity would be sufficient to feed the residents of the City of Augsburg for 30 years!

The European Union has pledged to meet the United Nations goal of halving food waste at the retail and consumer level, and reducing food losses along production

and supply chains by 2030 (Agenda 2030 UN SDG 12.3). In 2023, the Federal Ministry for Food and Agriculture (Bundesministerium für Ernährung und Landwirtschaft) and German food wholesale and retail trade companies ratified a pact to reduce food waste, with the goal of reducing it in their companies by 30 % by 2025 and by 50 % by 2030.

Food waste prevention is required on all levels of the value chain

Implementation of food waste prevention measures is already mandatory under the Waste Frame- >>

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Kick-off at the coordinator Sintef in Trondheim, Norway



>> work Directive. They exist on all levels of the value chain. Food waste can already be prevented in primary production by optimising harvesting techniques. It is also possible to process non-marketable goods. In addition, optimised logistics concepts can be used in processing and production to ensure less damaged or spoiled food. The food retail industry can opt for price reductions or food donations and food sharing to prevent food with a short shelf life from becoming waste. Many digital measuring devices and monitoring apps now exist for the eating out sector (restaurants, canteens, etc.), which demonstrably lead to less food waste. One possibility for reaching citizens is to sensitise them by integrating the topic in curriculums and educational programmes.

The EU sets measurement standards and names minimum quality requirements

To organise EU-wide monitoring, the EU Commission published the delegated decision (EU) 2019/1597 supplementing the Waste Framework Directive. In it, a common methodology and minimum quality requirements are described for the uniform measurement of levels of food waste and waste reporting obligations are introduced. The measurement methods named are direct measurement, mass balances, waste composition analysis, interviews, coefficients and production statistics, counting



Use of the "Food resource manager" in a catering kitchen

and diaries. Which of the methods is used depends on the actual situation of the investigation level and must be assessed case by case.

Contact: Fatah Naji
fnaji@bifa.de

Ash treatment according to ITAD guidelines

Waste legislation classification of ash from household waste incineration

Approx. 6 million tonnes of bottom ash (IBA) per year are produced in the thermal treatment of municipal solid waste and commercial waste in Germany.

The incinerator operator must arrange for testing to determine whether a specific IBA meets the conditions of the legal presumption as nonhazardous waste. In the worst case, the heavy metal levels lead to classification

as environmentally hazardous waste in accordance with the German Waste List Ordinance (Abfallverzeichnisverordnung).

Working on behalf of the IGAM and ITAD associations, bifa developed guidelines on the classification of bottom ash from the thermal treatment and energy recovery of household waste and household-type waste. In these guidelines, the single substances and substance groups in the bottom ash are subjected to differentiated consideration.

Classification by a three-stage procedure

This three-stage process provides for general screening of the hazard-relevant properties, a worst-case analysis assuming that all elements are present in the most hazardous expected compound and an evaluation of the realistic composition based on scientific expertise. The practical guidelines are recommended by the Bavarian State Ministry of the Environment and Consumer Protection (Bayerischen Staatsministerium für Umwelt und Verbraucherschutz) as a suitable basis for the classification of IBA according to the Waste List Ordinance.



Residual mineral fraction of the bottom ash after ash treatment

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>> It differentiates between the basic test, which provides a basis for the assessment of all hazard classes and the periodic test in which only the hazard-relevant property HP 14 (environmentally hazardous) is explicitly tested. The practical guidelines provide for additional interim tests with significantly reduced test scope for ongoing monitoring of the ash quality.

bifa carries out these classification and follow-up control tests according to the practical guidelines. This includes proper sampling in accordance with the sampling regulations LAGA PN 98, high-quality sample preparation by crushing, grinding and screening, and analytical charac-

terisation in the laboratory, as well as detailed assessment of the results with suggestions for classification of the respective ash sample.

The legal basis of the waste classification is not static. This mainly concerns the harmonised classification of single substances, as well as the definition of hazard-relevant properties and the rules on the basis of which the substances are classified. bifa therefore updates the guidelines regularly.

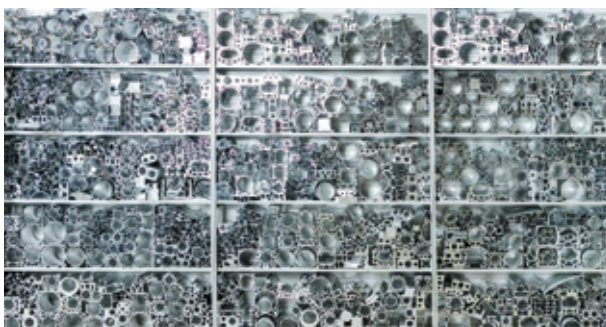
Contact: Markus Schönheits
mschoenheits@bifa.de

Environmental product declaration for aluminium profiles

bifa produces EPD for the products of Gartner Extrusion GmbH

Gartner Extrusion GmbH in Gundelfingen a.d. Donau produces aluminium profiles as semi-finished products, mainly for the construction, machine building and automotive industry. The extruded profiles are surface treated, machined and joined in various value-added steps.

bifa has created the environmental product declarations for the company's standard products for use in B2B communication. EPD are now very important, particularly in the construction industry. They are frequently required in tender specifications and form the basis by which architects and designers can design buildings sustainably and assess them environmentally.



Determination of EPD

The EPD are based on life-cycle assessment standards ISO 14040/44, the specific standards EN 15804 and ISO 14025 and other LCA rules specifically for aluminium products.

By providing precise requirements for the creation of an LCA and an independent critical review, EPD provide a uniform, fact-based and thus comparable basis for the environmental assessment of products.

As Gartner Extrusion has its own remelting installation in which it can use extensive aluminium scrap for the profile production, the environmental assessment of the aluminium profiles is very good compared to the industry average.

The five EPD created by bifa for Gartner Extrusion have been certified by Institut Bauen und Umwelt e. V. and can be retrieved there:

<https://ibu-epd.com/veroeffentlichte-epds/>

Contact: Thorsten Pitschke
tpitschke@bifa.de

BRIEFLY INFORMED

TRADE FAIR

IFAT 2024 on 13 – 17 May in Munich

The IFAT is the most important trade fair worldwide for innovations and services in the water, wastewater, waste and raw materials management sectors.

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We look forward to meeting you!

Harnessing secondary raw materials from silicon photovoltaic production

Assessment of waste and by-products for the optimisation of manufacturing processes

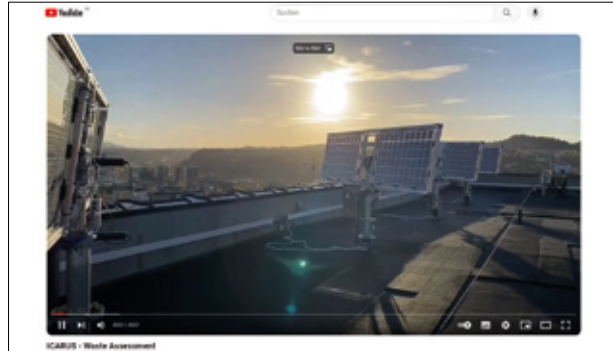
In the EU ICARUS Horizon project (grant agreement No. 958365), 17 partners coordinated by Sintef, Norway, are working on eco-efficient refining pathways for secondary raw materials from the production of silicon ingots and wafers, in order to develop them for high-quality markets.

ICARUS supports the expected European growth in the necessary recovery of high-quality silicon-based secondary raw materials and the auxiliary substances used by optimised treatment pathways. The process waste which is, for example, rich in high-purity silicon and is characterised by high energy consumption in production, is converted into high-quality secondary raw materials for various industrial applications.

Harvesting secondary raw material potential

The wafer production process is very energy-intensive and produces waste streams that still contain a substantial quantity of silicon and other valuable substances such as graphite. Harvesting this secondary raw material potential reduces the European dependency on imports and the costs of an improved environmental performance.

Within the scope of the ICARUS project, bifa is responsible for the topic of waste assessment. To this end, avail-



<https://www.youtube.com/watch?v=9-UWwVjAzg8>

able information is collected on the input and output substances and the waste-producing process itself. The information about by-products and waste and their specific properties are then each assessed to determine whether they are a by-product or waste and whether hazardous properties exist or not. The results are also used to optimise the manufacturing processes.

The bifa approach is shown in the video using the example of the waste stream of high-quality graphite.

Contact: Karsten Wambach
kwambach@bifa.de

Start of Quasar PV recycling research project

Kick-off on 7 and 8 February 2024 at the coordinator Sintef in Trondheim, Norway

The "Quasar" project is a four-year project with 20 international partners from Europe and the USA which is funded by the European Commission within the scope of Horizon Europe (grant agreement No. 101122298).

The objective of the project is to achieve a 70 % eco-efficiency improvement in the recovery of photovoltaic modules through closed-loop recycling with highly improved recycling rates, systematic collection of PV modules and the system management via digital twins. Achievement of the project objectives is demonstrated by the setting up and operation of two pilot PV recycling plants in Europe.

bifa will determine the improvements achieved by the new, sustainable processes compared to a benchmark, which represents the state-of-the-art at the start of the project, with two eco-efficiency analyses, one after around 2/3 of the project period and one at the end of



the project. Furthermore, bifa provides support with the assessment of the PV array dismantling and the collection systems as well as the strategy for utilisation of the results.

Contact: Karsten Wambach
kwambach@bifa.de

und im
Umwelttechnologie-
Cluster Bayern e. V.
www.umweltcluster.net



bifa Umweltinstitut
GmbH ist Mitglied im
Förderverein KUMAS e. V.
www.kumas.de



Redaktion:
Anita Gottlieb
Tel. +49 821 7000-229
presse@bifa.de

V.i.S.d.P.:
Prof. Dr.-Ing. Wolfgang Rommel
Geschäftsführer
Tel. +49 821 7000-111

Tel. +49 821 7000-0
Fax. +49 821 7000-100
solutions@bifa.de
www.bifa.de

bifa Umweltinstitut GmbH
Am Mittleren Moos 46
86167 Augsburg

Photos: title: stock.adobe.com; highwaystarz; page 2 (above): Dominik Leverenz, Universität Augsburg; title and page 3 (below): Gartner Extrusion GmbH; title and page 4 (below): pixabay.com; all others: bifa Umweltinstitut GmbH