

Reclassification of copper under ATP 22

Implications for the HP 14 assessment of waste



Since May 2026, ATP 22 – an amendment to the CLP Regulation – has been mandatory and has a direct impact on the classification of copper-containing waste with regard to HP 14. Fine-particle metallic copper is now classified as acutely and chronically toxic to aquatic life, Category 1 (H400 and H410, respectively). The decisive factor here is a specific surface area of $> 0.67 \text{ mm}^2/\text{mg}$, which distinguishes it from its solid form.

This surface area criterion is virtually impossible to implement in waste management practice. For waste and mixtures of unknown composition, there is no practicable routine method for determining the mass fraction of

copper particles with a specific surface area $> 0.67 \text{ mm}^2/\text{mg}$. In accordance with the precautionary principle, the total content of metallic copper would therefore have to be taken into account in cases of doubt. This could result in numerous copper-containing wastes having to be classified as hazardous solely on the basis of the precautionary principle – with significant consequences for authorisations, storage, transport, disposal and, in particular, the recovery of these wastes.

ATP 22 also replaces the previously used and comparatively straightforward particle size criterion with the specific surface area criterion. Whilst a particle >>

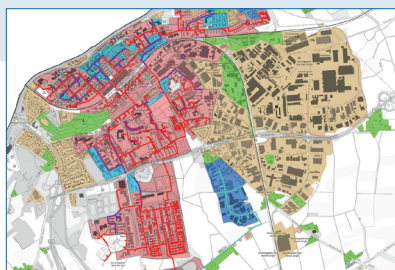
page 2 AI Future

Developing potential applications for AI in environmental technology



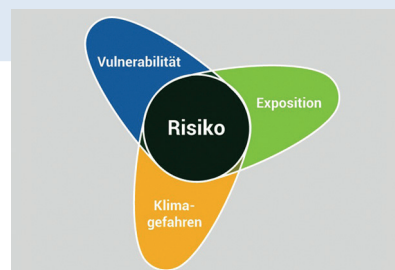
page 3 Neu-Ulm's municipal heating plan approved

bifa develops strategies for sustainable heat supply



page 4 Excel worksheet on climate adaptation in businesses

From risk analysis to climate adaptation strategy

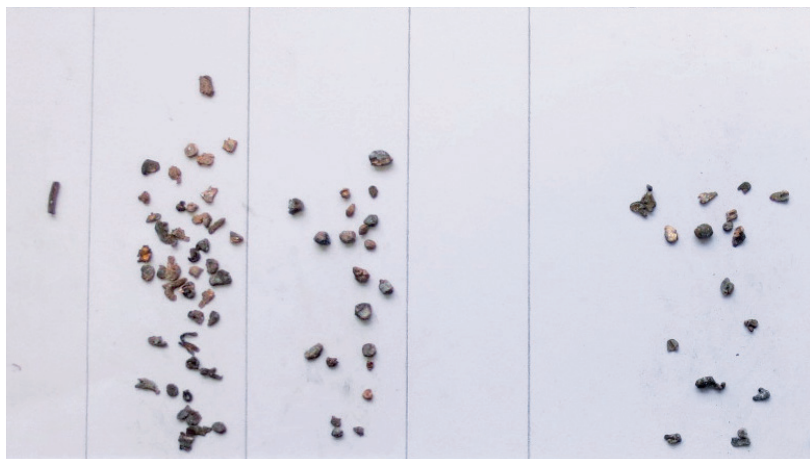


>> size limit of 1 mm was previously used to distinguish between solid and finely divided forms, a surface area limit of $0.67 \text{ mm}^2/\text{mg}$ now applies to copper.

Assessment of aquatic toxicity and approaches to a risk assessment suitable for enforcement

However, a re-evaluation of the data used by ECHA shows that this criterion significantly overestimates the chronic aquatic toxicity of spherical copper particles with diameters greater than 0.33 mm. Although the threshold of $0.67 \text{ mm}^2/\text{mg}$ is based on the previous 1-mm convention, it does not take sufficient account of the actual relationship between specific surface area and aquatic toxicity.

Against this background, a risk assessment is proposed that is based on the ECJ's 'Mirror Entry' judgement of 28 March 2019. Under this approach, proportions of metallic copper that are reliably present in solid form could be excluded, and the remaining proportion assessed on the basis of its probable aquatic effect. This would enable a proper classification without underestimating aquatic toxicity or systematically overestimating it on the basis of the precautionary principle.



Isolated copper and other non-ferrous particles from grate ash

Furthermore, the problems associated with ATP 22 highlight that future amendments to the CLP Regulation must take greater account of practical enforceability. Owing to the close connections with waste, transport, and major-accident legislation, amendments to the CLP Regulation can have significant implications for downstream areas of law and the circular economy.

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AI Future

Developing applications for AI in environmental technology

As part of this project, the bifa Environmental Institute is developing practical scenarios for the use of artificial intelligence (AI) in municipal waste management. The project is being carried out on behalf of the Bavarian State Ministry for the Environment and Consumer Protection (StMUV).

The project has been prompted by growing structural challenges in municipal waste management: rising quality requirements, limited staff and technical resources, and the need for data-driven decision-making are making optimisation difficult. At the same time, the use of AI in

waste management is developing rapidly. However, its practical applicability and cost-effectiveness are difficult for many local authorities to assess.

bifa is investigating the potential and challenges of AI for municipal waste management

In doing so, bifa is involving public-sector waste management authorities and developing practical AI application scenarios. These are intended to provide targeted support to local authorities in introducing suitable AI applications.



The project marks the start of the systematic use of artificial intelligence for research across the entire bifa and creates opportunities for future projects.

At the start of the project, the current state of the art was analysed at both national and international levels with regard to digital and AI-supported approaches in municipal waste management. A needs analysis was carried out along the process chain to identify priority areas for action.

A core group comprising public utility companies, public authorities, citizens, plant operators, academia, and industry is currently being formed to better understand the expectations, needs and differing per- >>

>> perspectives of stakeholders, and to focus on specific use cases, regulatory developments and the direct added value for businesses and public authorities. Participants will identify specific efficiency gains through AI applications, receive support with regulatory requirements, and benefit from best practices and pilot projects.

As part of the project, bifa is currently building up internal AI expertise by thoroughly analysing the potential of AI, investigating realistically applicable AI methods at bifa and examining the requirements for data, skills and infrastructure needed for AI integration at bifa.

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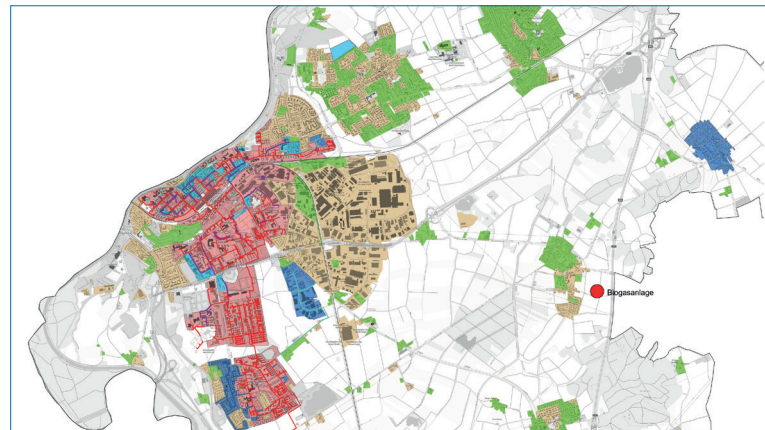
Neu-Ulm Approves Municipal Heating Plan

bifa Environmental Institute develops strategies for sustainable heat supply

Between January 2025 and February 2026, bifa worked on behalf of and in collaboration with the City of Neu-Ulm to draw up a Municipal Heating Plan with the aim of achieving a cost-effective, resilient and greenhouse gas-neutral heat supply by 2040. The City of Neu-Ulm built on its previous climate protection activities.

The project involved an assessment of the current heating supply and an analysis of the potential for renewable heat sources. The scope ranged from inner-city neighbourhoods to more rural districts. Building on this, a target scenario for 2040 was developed, taking into account solutions for locally varying supply situations.

A key component of the project was the close involvement of specialist stakeholders and the public. In particular, data and measures were coordinated in detail with the local energy supplier, SWU. Two workshops facilitated by bifa gathered a broad range of perspectives and proposals from specialist stakeholders. These two public information events drew a great deal of interest. Even during the course of the project, interests regarding waste heat discharge and district heating supply on an industrial scale were brought together. The city of Neu-Ulm is very well placed to drive forward heat transformation in a targeted manner, thanks to its own climate protection management system and the committed district heating provider SWU.



Projected heat supply areas 2025–2040

bifa draws up a municipal heating plan

On 3 February 2026, the Municipal Heat Plan was approved by the Planning and Environment Committee. The city of Neu-Ulm is receiving financial support for its development from the Climate and Transformation Fund of the National Climate Protection Initiative run by the Federal Ministry for Economic Affairs and Climate Protection.

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BRIEFLY INFORMED

EVENT

38th VDI/ITAD Conference on Thermal Waste Treatment 2026

Industry gathering for waste incineration operators from **23 to 24 September 2026** in Würzburg

bifa will be represented with two presentations:

Prof. Dr Nadine Warkotsch (Managing Director)

Dipl.-Chem. Hermann Nordsieck (Research Associate)

AI in municipal waste management

Online event on **9 July 2026**,

9.30 am – 12.00 pm

AI-based solutions in waste management, current developments



bifa develops Excel-based tool for business climate adaptation

From risk analysis to climate adaptation strategy

Through its Environmental Economy Information Centre (IZU), the Bavarian State Office for the Environment (LfU) supports businesses in systematically identifying operational climate risks and gradually integrating climate adaptation into their corporate strategy.

On behalf of the IZU, bifa has developed an Excel tool for climate adaptation aimed at businesses, which enables small and medium-sized enterprises in particular to carry out a structured initial assessment of their risks.



The tool guides users through an operational impact analysis with risk assessment and provides guidance on systematic action planning. For example, companies can assess how vulnerable their buildings and technical installations are to heat or flooding, which operational processes are particularly critical in the event of power cuts or disrupted supply chains, and what organisational or technical measures can be derived from this.

The tool can be downloaded free of charge:

<https://www.umweltpakt.bayern.de/werkzeuge/klimaanpassung/>

bifa is currently developing a concise video tutorial on how to use the Excel guide. Once completed, the tutorial will be made available via the LfU's YouTube channel (<https://www.youtube.com/@lfu-bayern>) and will explain the individual steps – from data entry to analysis – online.

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A look back at IFAT 2026

The world's leading trade fair for environmental technology, 4–7 May, Munich

With around 142,000 visitors from almost 160 countries, some 3,400 exhibitors and 461 presentations, IFAT Munich 2026 reaffirmed its role as the world's leading trade fair for environmental technologies on the occasion of its 60th anniversary.

For bifa, the trade fair provided an important platform to present research findings, innovative projects, and practical solutions to an international audience of experts. The in-depth discussions with partners, customers and trade visitors demonstrated the high level of interest in current challenges and potential solutions in the fields of the circular economy, energy, and climate.

The specialist presentations were also very well received. On the Hydrogen Stage, Dr Nico Bevilacqua presented: **"Systemic interrelationships, key questions and prospects for action in the transformation of environmental technology"**. On the Orange Stage, Prof. Dr Nadine Warkotsch opened the discussion on the role of thermal waste treatment in the context of the carbon cycle: **"Waste and Climate – On the Path to Net-Zero Emissions"**, as well as innovative recycling technologies, new



business models and strategies for closing textile material cycles: **"Textile Recycling and the Circular Economy for a Better Future"**. The high level of participation underscored the need for application-oriented research and scientific analysis.

For bifa, IFAT 2026 was a successful event that strengthened existing partnerships, facilitated new contacts, and provided valuable impetus for future projects and collaborations.

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