

## Corrugated board packaging and alternative reusable packaging

bifa analyses the greenhouse footprint of packaging in online retailing

As part of a study carried out for DIE PAPIERINDUSTRIE e.V. and the Verband der Wellpappen-Industrie e.V. (Association of the Corrugated Cardboard Industry) in cooperation with PTS, bifa investigated the climate protection potential of packaging made of corrugated cardboard or corrugated base paper compared to new reusable plastic products emerging on the market.



### Reusable systems for shipping packaging?

About 90 % of the shipping packaging used today is made of corrugated board. After a single use, they are usually recycled and returned to the waste paper cycle. Reusable systems for shipping packaging are even less established in the business-to-consumer sector today.

The avoidance of packaging waste is receiving widespread social and political attention today in the context of the climate protection debate. In this context, the use of reusable packaging is often called for, in order to substitute the ecologically supposedly less advantageous disposable packaging. For the packaging cases investigated in the study, however, it is shown that in the GHG balance there is no overall environmental advantage of reusable systems over packaging made of corrugated cardboard. Both the use of corrugated cardboard and the

use of reusable systems have their justification. An evaluation must therefore be differentiated and always be based on a specific packaging case.

For packaging made of corrugated cardboard, in addition to the most resource-saving, energy-efficient production possible, the packaging weight is a central factor.

For corrugated cardboard packaging, the packaging weight is a key factor influencing the life cycle assessment.

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## Heat service instead of heat stress – what do municipalities need?

New project commissioned by the Federal Ministry of Health (Bundesgesundheitsministerium)

The adverse health effects of heat range from general discomfort to hospital admissions and deaths. Vulnerable groups are particularly affected, as they are either especially exposed or have limited adaptive capacity or access to resources such as information and support. Municipalities

bear special responsibility for the health protection of all population groups, but are often overwhelmed by the complexity of this task.

The new joint project of the University of Munich, Ecolo – Agency for Communication and Ecology and bifa will develop the platform [www.hitze-service.de](http://www.hitze-service.de) to support municipalities with needs-oriented, tailor-made solutions. Through interviews, workshops and a nationwide online survey, adaptation needs, gaps and already established, successful heat protection measures will be identified. To ensure that this needs analysis also leads to valid findings, we ask all municipalities to participate in as large a number as possible. Calls will be made in spring 2022 via the relevant municipal associations and networks.

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# aktuell

newsletter of bifa Umweltinstitut GmbH

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## Electronic nose finds unwanted biofilms in car air conditioning systems

bifa tests airco well® sensor from TUNAP GmbH & Co. KG



Measuring the test bacteria solution with the airco well® sensor

Even if you can't see them: Bacteria and fungi, usually present in small numbers in the air, are continuously introduced into ventilation systems. As soon as they find favourable growth conditions there (high humidity, usable nutrients, mild temperatures), they colonise the surfaces and in the long term even form biofilms visible to the eye.

Already in an early phase of colonisation, the microorganisms can be recognised by their odour, which is usu-

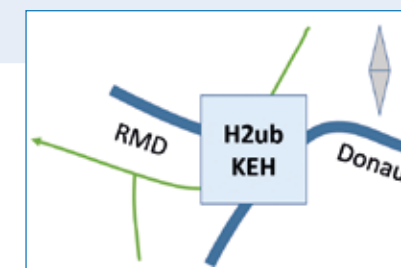
ally perceived as disturbing. These are decomposition products of their food and special odour substances (MVOC), whose functions for the microorganisms are not yet known in detail.

In ventilation systems, bacteria and fungi are not only undesirable because of the formation of disturbing odours. Some of them can also cause hygienic risks. Therefore, it is desirable to detect microbial colonisation of ven-

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Iron content causes losses



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New project commissioned by the Federal Ministry of Health





>> tilation systems as early as possible so that it can be eliminated again with suitable cleaning procedures.

#### The airco well® sensor

For this purpose, the company TUNAP has developed an odour sensor with innovative technology that can detect volatile substances (MVOCs) formed by microorganisms. The „electronic nose“ is based on a 3-layer sensor technology and is to be used to detect hygienically undesirable colonisation of car air-conditioning systems at an early stage and to record the success of cleaning measures.

#### The airco well® sensor in the test

The airco well® sensor is based on an electronic nose with a highly selective 3-layer sensor whose signal is analysed and evaluated with the help of an evaluation logic adapted to the odours.

The sensor was placed in humidified air during its 15-second calibration phase. Highly purified synthetic air humidified with ultrapure water was used for the measurement, which flowed through the test lugs at the time of measurement. As a result, the test air was enriched with the volatile substances formed by the microorganisms, which then acted on the airco well® sensor.

The investigation carried out by the bifa Umweltinstitut on behalf of TUNAP confirmed that the sensor detects



the odours of bacteria and fungi frequently found in odour-causing car air conditioning systems if they are present in numbers relevant to practice. This makes it possible to detect microbial colonisation of ventilation systems at an early stage. This will also improve the success of cleaning procedures, as it is much more difficult to remove widely formed biofilms.

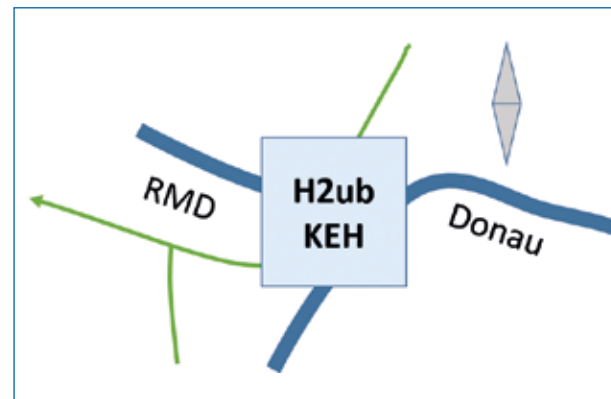
The airco well® sensor is currently in the market testing phase to observe the acceptance, usability and measurement reliability under real conditions in the everyday life of car dealerships and garages.

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## Hydrogen strategy for Kelheim – „Donau H<sub>2</sub>ub“

bifa accompanies the development of a regional concept for the hydrogen strategy

As „Donau H<sub>2</sub>ub“, the strategic location of the town of Kelheim in the rural area, on the Donau and on the Rhein-Main-Donau-Kanal is to be put into focus. The concept and the accompanying studies will consider the extent to which regional, regenerative, and in particular biogenic energy sources at the location can be used to produce hydrogen.



The city of Kelheim wants to become a hub for hydrogen with the Donau H<sub>2</sub>ub

Due to its location, Kelheim is ideally suited for analyses of the potential and role of future hydrogen technology. The city and region exemplify the big questions of our time. How can we generate, distribute and use energy sustainably and climate neutrally in the future? What role do regions and hubs in Bavaria play in future CO<sub>2</sub>-neutral scenarios?

#### Kelheim as a model region for hydrogen potential

The European Union, the Federal Government and the Bavarian state government have made the climate and energy transition as the most important political goals. Hydrogen is a complementary pillar in this context. It is to be used for storage, distribution and utilisation in areas that cannot be electrified easily or at all. Kelheim's location with its industrial area and port as the Bavarian gateway to and from the Donau links regional approaches with the major national and international challenges of our time. As a model region, Kelheim wants to exploit the potential of hydrogen (H<sub>2</sub>) as an additive pillar of

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>> a future CO<sub>2</sub>-neutral energy supply and implement national and international approaches locally.

The project will analyse how renewable energy sources can be used to produce hydrogen. In the process, climate effects will be considered in the field of tension in which the production and use of hydrogen finds itself. For example, there is competition for the direct use of green electricity from technologies with higher efficiency, such as electric cars. Scenarios such as the production of hydrogen from temporary and regional green surplus energy or from biogenic sources will also be analysed.

Likewise, the use of hydrogen for sectors whose electrification is not practicable according to the current status will be considered in Kelheim. Tourism and passenger shipping at the Donau breakthrough in the direction of Weltenburg can be mentioned here as an example. The question arises whether this can be made CO<sub>2</sub>-neutral with the help of regionally produced hydrogen.

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## Thermal phosphorus recycling from sewage sludge

Iron content causes losses

*The Sewage Sludge Ordinance stipulates that phosphorus recovery must take place in sewage treatment plants with more than 100,000 p.e. from 2029 and with more than 50,000 p.e. from 2031.*

The company Grenzebach BSH GmbH (Bad Hersfeld) is currently developing a thermal process for P-recovery from sewage sludge. It has been shown that the effectiveness of the process depends, among other things, on the iron content of the sewage sludge. Since iron has a high affinity for the formation of ferrophosphorus and binds the phosphorus, a high iron content in the sewage sludge can be associated with high phosphorus losses in this thermal process.

#### The iron content depends on the phosphorus elimination

The iron content in sewage sludge is strongly influenced by the type of P-elimination agent used in the sewage treatment plant. For this reason, Grenzebach commissioned bifa Umweltinstitut GmbH to conduct a survey of Hessian and Bavarian sewage treatment plants (> 50,000 p.e.) on the use of precipitants and P recovery strategies.



Of the 132 WWTPs participating in the survey, 41 use iron-based and 8 aluminium-based precipitants. 78 use mixtures or several precipitants. Regarding the P-strategy, 51 stated that they are still waiting for the current developments, 11 are thinking of building a plant in their own municipality, 19 are planning a special purpose association or have already founded one. 49 said they would outsource phosphorus recycling.

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MERRY CHRISTMAS  
AND A HAPPY NEW YEAR!

