

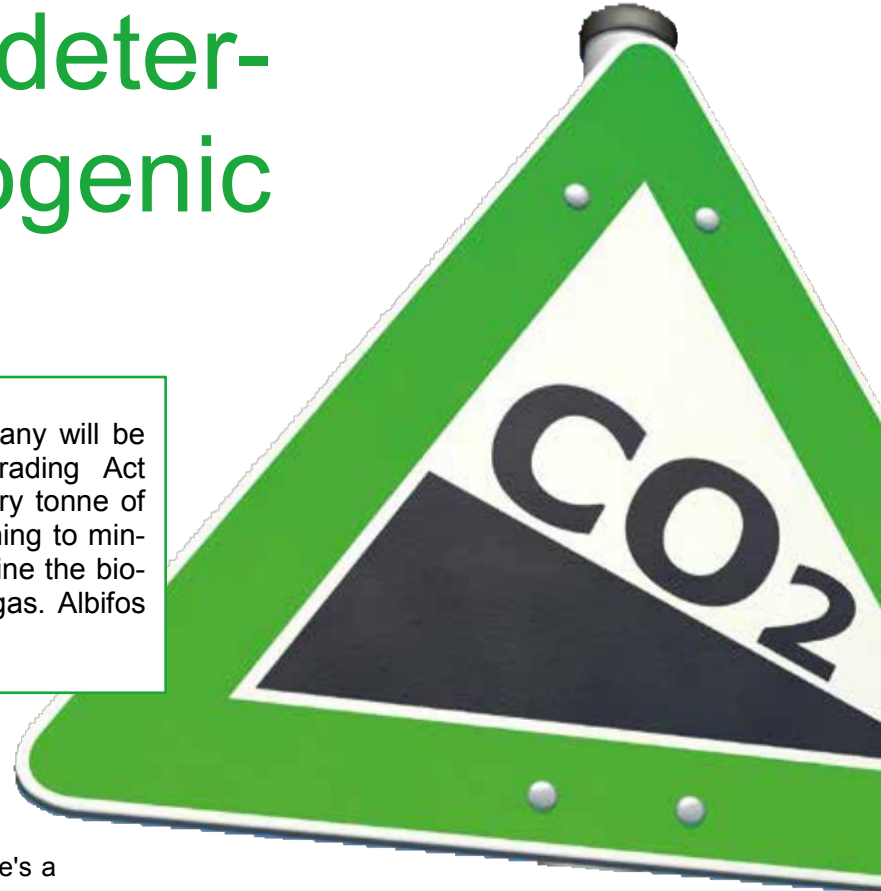
The biogenic proportion of CO2 emissions can be determined very precisely.

(Image: bluedesign - stock.adobe.com)

Albifos CO2 collector

Precisely determining biogenic CO2

All waste incineration plants in Germany will be included in the Fuel Emissions Trading Act (BEHG) from January 1st, 2024. Every tonne of fossil CO2 costs money. Anyone wishing to minimise costs ought to precisely determine the biogenic CO2 proportion in their waste gas. Albifos is one way of determining exact data.



René Baltus held many discussions at this year's VDI Conference on Thermal Waste Treatment in Würzburg. The product developer presented the Albifos CO2 collector at the large-scale event. "There's a great deal of interest in the technology," confirms Baltus.

The BEHG and everything that goes hand in hand with it is currently the big topic in the industry. The situation will get serious from January 1st, when it becomes mandatory for operators of thermal waste treatment plants to be charged for their CO2 emissions. However, as is customary in emissions trading, this only applies to fossil CO2 emissions, since the biogenic proportion is not included in national climate balances in accordance with international conventions.

Baltus is able to help operators of thermal waste treatment plants save money by determining the biogenic CO2 proportion with the Albifos CO2 collector. The inventor from the Rhineland is Managing Director of BVP - Gesellschaft für Beratung, Verfahren und Produkte mbH. By his own account, he has spent over 40 years developing, manufacturing, servicing and repairing devices for collecting 14C and tritium 3H in the exhaust air from nuclear power plants, repositories and other nuclear facilities. This experience was fed into the development of Albifos. The biogenic CO2 proportion can be determined very precisely by analysing the carbon isotopes.

The first operators have already successfully tested its technology. GMVA Niederrhein in Oberhausen - one of the largest plants in Germany with an incineration capacity of more than 700,000 tonnes per year - has rented out the CO2 collector to gather experience in one of the in-

cineration lines and analyse the results. The samples were successfully collected at GMVA on a monthly basis over a four-month test phase. There is currently an extended trial phase underway. As part of the service, the absorber container is collected and a new one with fresh absorber is installed at the same time. The service provider prepares the sample and sends it to an AMS laboratory.

Mass spectrometry can be employed to very precisely determine the biogenic CO2 proportion

The scientists in the AMS laboratories (accelerator mass spectrometry [1]) use accelerated mass spectrometry to determine the ratio of the carbon isotopes 12C, 13C and 14C and in doing so, can determine the proportion of biogenic CO2 with very high precision. The values from GMVA and another thermal waste treatment plant in which the technology from Baltus was also tested, ranged between 52 and 62 per cent biogenic content. "This ensures that the real biogenic CO2 proportion in the flue gas is determined with a high level of accuracy," explains Baltus.



Frank Nachtsheim, Technical Managing Director of GMVA in Oberhausen and René Baltus, Managing Director of BVP - Gesellschaft für Beratung, Verfahren und Produkte mbH. The Albifos CO2 collector can be seen in the middle. (Photo: BVP, GMVA)

The Albifos collector was developed in compliance with DIN EN ISO 13833. The liquid absorber NaOH is purchased in laboratory quality as a ready-made solution in tightly sealed packaging and filled into safe, double-walled, break-resistant containers. The gas sample is supplied and extracted through self-sealing push-fit connections. Protective caps with a strong design protect the connections against damage during transport.

The NaOH solution is separated from the sample gas through a membrane and consequently has no direct contact with it. "The use of sodium hydroxide solution has significant benefits for subsequent sample preparation. The contact times with the laboratory technicians' room and breathing air are kept extremely short with the caustic solution," explains Baltus.

The thermal waste treatment facilities ensure that 100 l/h of dried sample gas is transported correctly from the chimney to the collector. "Albifos has been able to collect without any problems so far, even under extreme temperatures of 45 degrees in the enclosure," says René Baltus. A cooled measuring container can ensure that the process runs smoothly for locations with greater heat exposure.

The use of Albifos is scrutinised and checked by GMVA Oberhausen with eagle eyes. A quarterly or half-yearly sampling cycle is envisaged for the plant in the Ruhr region in future. The correlating monthly analysis will also be calculated (see article on page XX). The correspondingly adapted collector was presented by Baltus at this year's VDI conference, Wuerzburg.

[1] Jürgen H. Gross, Massenspektrometrie, Springer 2009.

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Structure of the CO2 collection container.