



PRESS RELEASE

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Value from wastewater

Sewage sludge contains lots of valuable elements which are prized as fertiliser for use in agriculture. Phosphorus in particular is an important nutrient for plants. Researchers at Landshut University of Applied Sciences are therefore looking at ways in which wastewater treatment facilities can use sewage sludge effectively, particularly in rural areas. They are doing this in conjunction with partners based in the Czech Republic.

The sludge that settles in sedimentation tanks is full of valuable substances like phosphorus, nitrogen or potassium. For this reason, it is often used in agriculture as fertiliser on fields. However, the sewage sludge also often contains contaminants which are harmful to the environment and health such as microplastics, heavy metals like copper or zinc, hormone disrupters such as plasticisers, or pharmaceutical residues. According to the coalition agreement between the parties of the German federal government, spreading sewage sludge as fertiliser is to be discontinued and instead the compounds containing phosphorus are to be recovered for subsequent use in fertilisers.

Recovering phosphates from sewage sludge

"Phosphorus is a finite resource and easily accessible reserves are expected to be depleted in the next 80 to 120 years. German wastewater potentially contains around 70,000 tonnes of phosphorus which could be recovered each year, whereas Germany alone consumes some 120,000 tonnes per year," explains Prof. Diana Hehenberger-Risse from the Technology Centre for Energy at Landshut University of Applied Sciences. It is now mandatory for large wastewater treatment plants to recycle phosphorus. This could also make ecological sense for smaller facilities. However, according to Hehenberger-Risse, "The modifications required to recover phosphates are technically complex and require massive investment on the part of smaller sewage plants. To make it worthwhile and ensure that sewage charges don't skyrocket, municipal authorities need to cooperate and find a joint solution." To find out what that could be, the environmental scientist is working on a research project known as greenIKK. Partners on the project include her colleague at Landshut, the chemist Prof. Josef Hofmann, IKOM Stiftland (a special purpose association) and the Czech Forestry and Game Management Research Institute. The Landshut faculties for Mechanical Engineering

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and Interdisciplinary Studies also participate substantially in the project. Together their objective is to use sewage sludge effectively. "This reduces the emission of greenhouse gases and increases resource efficiency," says Hehenberger-Risse. The project is scheduled to run until the end of 2019 and is being financed by the European Regional Development Fund.

The objective: to use sewage sludge effectively

The researchers are focusing on the district of Tirschenreuth in Bavaria and the neighbouring region of Tachov/Cheb in Czechia. "Among other things, we are looking at how to recover phosphorus, nitrogen and trace elements from wastewater and sewage sludge in a commercially and ecologically viable way," explains Hofmann. "Our Czech partners are assisting us with chemical analysis. As well as measuring the phosphorus content, they will be determining its quality as a fertiliser, i.e. how easily plants can utilise it."

Often some of the sewage sludge from facilities is dried and incinerated. Phosphorus can also be extracted from the ash. A complex process of drying is necessary to ensure that the sludge burns readily. "That requires a lot of energy," says Hehenberger-Risse. With the project partners she therefore wishes to test whether wastewater treatment plants can use solar power for drying purposes and if so which ones. They are also exploring whether it makes sense for plant operators to join forces and dry sludge from various local authorities at central facilities.

Small wastewater treatment plants need to be both ecologically and economically sound

"To date, there have only been studies about disposing of sewage sludge and which deal with some aspects of specific wastewater treatment sites, towns, cities or administrative districts. This project is designed to consider methods of disposal and related options by taking an integrated, holistic approach," says Hehenberger-Risse in summary. At the end of the project, she and her colleagues will draw up recommendations for action enabling participating authorities in Germany and the Czech Republic to make good, common use of sewage sludge across borders from both an ecological and economic perspective. According to Hehenberger-Risse, "This can then likewise benefit other communities in neighbouring regions."

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Sewage sludge contains lots of valuable elements such as phosphorus. In order to recover it wastewater treatment facilities need to invest.



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Together with partners Prof. Diana Hehenberger-Risse and Prof. Josef Hofmann of Landshut University look at ways in which smaller sewage treatment facilities can recycle phosphorus effectively.

About Landshut University of Applied Sciences

Landshut University of Applied Sciences is synonymous with excellent teaching, further education and applied research. Together the six faculties – Business Administration, Computer Science, Electrical and Industrial Engineering, Interdisciplinary Studies, Mechanical Engineering and Social Work – provide more than 30 degree programmes. Courses are clearly aligned with the current and future requirements of the job market. With some 5,300 students in total, learners benefit from the high practical relevance of the teaching, individual support and modern technical facilities. The university also covers a broad range of project topics on behalf of research institutions and companies, with support and implementation provided by research professionals with the best expertise. There are over 115 professors at the university engaged in teaching and research.