



'Surprisingly, we know very little about the contents of sewage sludge'

Through the SDG Accelerator programme, the utility company Fors A/S has set out to purify sewage sludge with the help of plants, heat and patience.

Many primary school students have probably wrinkled their noses when visiting a wastewater treatment plant. After impurities have been removed, the bacteria start processing the muddy sludge, which later ends up fertilising our fields. This simplified description is a good example of how nature could work, if it weren't for the fact that the sludge might contain microplastics, pharmaceutical residues and other problematic substances. This is something Fors A/S is committed to change, project manager and innovation consultant Lærke Ærenlund explains:

'As a multi-utility company, we supply water and heat, collect waste, manage recycling depots and wastewater treatment plants in the Danish municipalities of Holbæk, Lejre and Roskilde. It is only reasonable, therefore, that we should work with the Sustainable Development Goals. If something is close to our hearts here at Fors A/S, it is a green and healthy environment.'

Like many other utility companies, Fors A/S has long been concerned about the increasing levels of harmful substances in the sewage sludge, which is discharged in the fields, says Lærke Ærenlund:

'The sludge contains many vital nutrients, and thereby plays a crucial role in enriching our soils. Unfortunately, it might also contain various substances that potentially can

Sustainable Development Goals at play

SDG 12: Responsible consumption and production

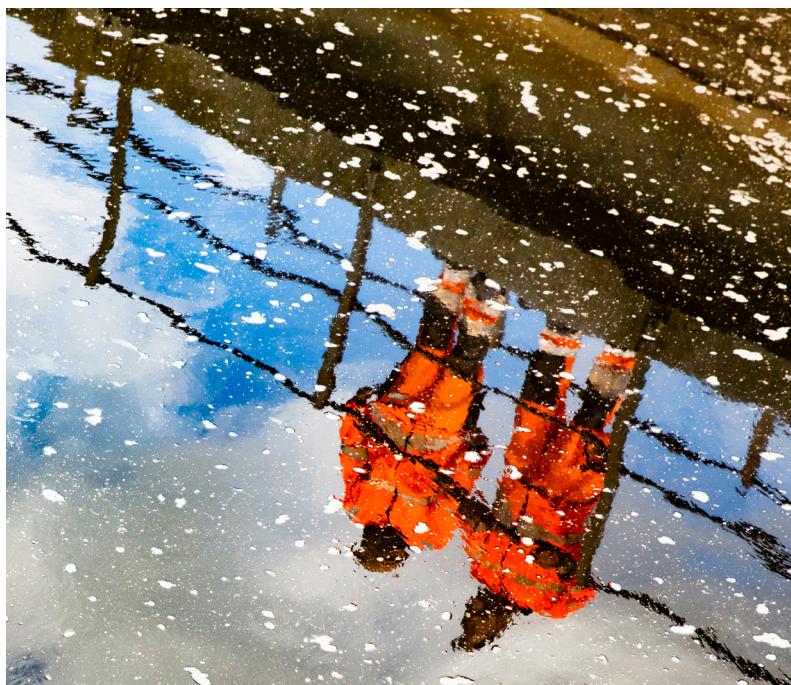


Target 12.2: By 2030, achieve the sustainable management and efficient use of natural resources.

end up harming the environment. In Germany, this has caused authorities to ban the spread of sewage sludge, which might also become the case in Denmark.'

Faced with increasing levels of harmful substances, Fors A/S found it necessary to rethink how they could optimize their wastewater treatment. It was in this process that mineralisation was considered as a possible solution, Lærke Ærenlund explains:

'Sludge mineralisation is a method of purifying the sludge through a natural combination of soil, plants and patience. The process is already implemented at several of our treatment plants today and works well in the Danish climate. What has never been done before however, is moving the mineralisation process into greenhouses, which is likely to improve the degradation of harmful substances such as microplastics, pharmaceutical residues and so-called polycyclic aromatic hydrocarbons. By improving dewater-



ing properties and reducing the amount of sludge, we moreover believe the warmer climate to have a positive effect on the sludge mineralisation process itself.'

In the SDG Accelerator programme, Fors A/S has developed its solution further and calculated on the economic potential of sludge as a valuable resource for example as the basis for bio-fertiliser rather than a problematic substance, which it costs money to get rid of. The SDG Accelerator was also used to convene a range of relevant experts – each with in-depth knowledge of one or more of the many processes involved. Lærke Ærenlund explains:

'We are convinced that sludge mineralisation in greenhouses is a good idea, and have the data to support our hypotheses. We are now entering a phase of extensive research, which must be carried out in collaboration with expert advisors and academia. We expect it to be a time-consuming process, since we need at least a winter season and a growing season to observe how the sludge behaves. Realistically therefore, the experiment is expected to run for a minimum of 21 months, whereby data is collected continuously. If the experiment, at any time, proves to fall short, we always have the opportunity to either adjust the set-up or to stop it altogether.'

Although Fors A/S is moving into unknown territory, Lærke Ærenlund is convinced that the world as a whole is entering a new era when it comes to treating sewage sludge:

'We clearly need to find new ways of handling sewage sludge if we are to ensure a clean environment for future generations. With controlled mineralisation in greenhouses, we decompose waste on the one hand and transform sludge into a valuable agricultural resource on the other, thereby turning an expense into a source of revenue. If we succeed in refining the method, we might hold a solution with global potential in our hands. It all starts in a greenhouse in Kalundborg. That's where we need to crack the code.'

This is how Fors A/S contributes to the Sustainable Development Goals

- Fors A/S will test a new method for cleaning sewage sludge in greenhouses based on soil, plants and heat.
- The sludge mineralisation in greenhouses is expected to contribute to the decomposition of potentially problematic substances such as microplastics, chemical substances, pharmaceutical residues and polycyclic aromatic hydrocarbons (PAH).

Facts about Fors A/S

- A multi-utility company
- Provides water and district heating, cleans wastewater, collects waste and operates recycling sites
- Owned by the Danish municipalities of Holbæk, Lejre and Roskilde
- Head offices in Holbæk and Roskilde, Denmark
- Approximately 180 employees



'As a multi-utility company, we have a clear ambition to work for a healthy environment and the sustainable management of the world's resources. With sewage sludge mineralisation in greenhouses, we want to contribute in keeping valuable resources in circulation for the benefit of the entire value chain. It will be a crucial contribution to the environment.'

Henrik Correll
Head of production, Fors A/S