

Scaling up the treatment of wastepaper sludge: The circular startup and the multinational

THE AMBITION OF THE DUTCH CIRCULAR TECHNOLOGY DEVELOPERS OF ALUCHA IS TO BECOME A WORLD-LEADING SUPPLIER OF SOLUTIONS FOR COMPLEX WASTE STREAM. AT PILOT SCALE, THEY HAVE A PROVEN TECHNOLOGY FOR TREATING WASTEPAPER SLUDGE. TOGETHER WITH THEIR CLIENT ESSITY, AND BILFINGER TEBODIN'S SCALE-UP PROGRAM, THEY ARE NOW TAKING THIS TECHNOLOGY TO THE INDUSTRIAL SCALE.

Tom Berben, Essity's Environmental Compliance Director: 'In our tissue business, about 50% of the cellulose fibers is sourced from collected paper waste. The process includes intensive cleaning of the reusable fibers, which results in substantial amounts of de-inking sludge.' Essity is a global producer of hygiene and health products and solutions.

Returning sludge to natural components

Alucha, a circular startup, has developed a process that separates dried sludge into reusable materials, in essence returning the sludge into its raw natural components. Gijs Jansen, Managing Director of Alucha: 'We develop recycling technology for complex waste streams consisting of both organic and inorganic materials. In the past ten years we have successfully implemented our solution for the recycling of drink cartons. Now, our focus is on paper sludge.'

Partners in scale-up engineering and development

'The technology now works on a pilot scale of 100 kilograms per hour, and Essity is interested in applying the technology on an industrial scale. We can handle the technological side of developing our first industrial-size unit, but there's also the challenge of things like permitting, procurement and the integration in an existing mill site.'

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Petra Beris (right), Gijs Jansen (left) at the pilot plant

This is where Bilfinger Tebodin with its scale-up program comes in. 'Timing, complexity and budget are the biggest challenges on this project', says Tom Berben. 'We aim to be able to process 1,300 kilograms of sludge per hour in one of our German facilities in 2019. Alucha has the technology, and Bilfinger Tebodin has just the right expertise in scale-up engineering and project management.'

Petra Beris, Manager of Bilfinger Tebodin's Circular Economy Start-up Platform: 'This project is a fine example of scaling up circular technology, with a



Petra Beris



Tom Berben, Environmental Compliance Director Essity

developer and end client who had already teamed up before we got involved. We are now working as an integrated team, both on the scale-up project itself and on finding applications for the bio-based minerals.'

'Developing novel sustainable recycling technology at an industrial scale is hard work, but in the end it will make the world a better place', concluded Gijs Jansen. We are grateful to work with other great organizations such as Essity and Bilfinger Tebodin, who are just as enthusiastic as we are.' ■

At the heart of the process is pyrolysis, or heating the dried sludge without any oxygen. Before the process can start, the sludge is dried in a conventional process. Then it is fed into a reactor that is completely depleted of oxygen. Here the sludge is heated, which causes the material to break down into its basic components: organic components, which are converted back into oil, and inorganic components, mainly calcium carbonate, which can also be separated for re-use.



From a circular perspective, paper sludge is a source for raw materials. The sludge is what remains when reusable fibers have been extracted from wastepaper in the recycling process. Traditionally, the sludge is disposed of in landfill, landspreading or used as a source material in the cement industry.