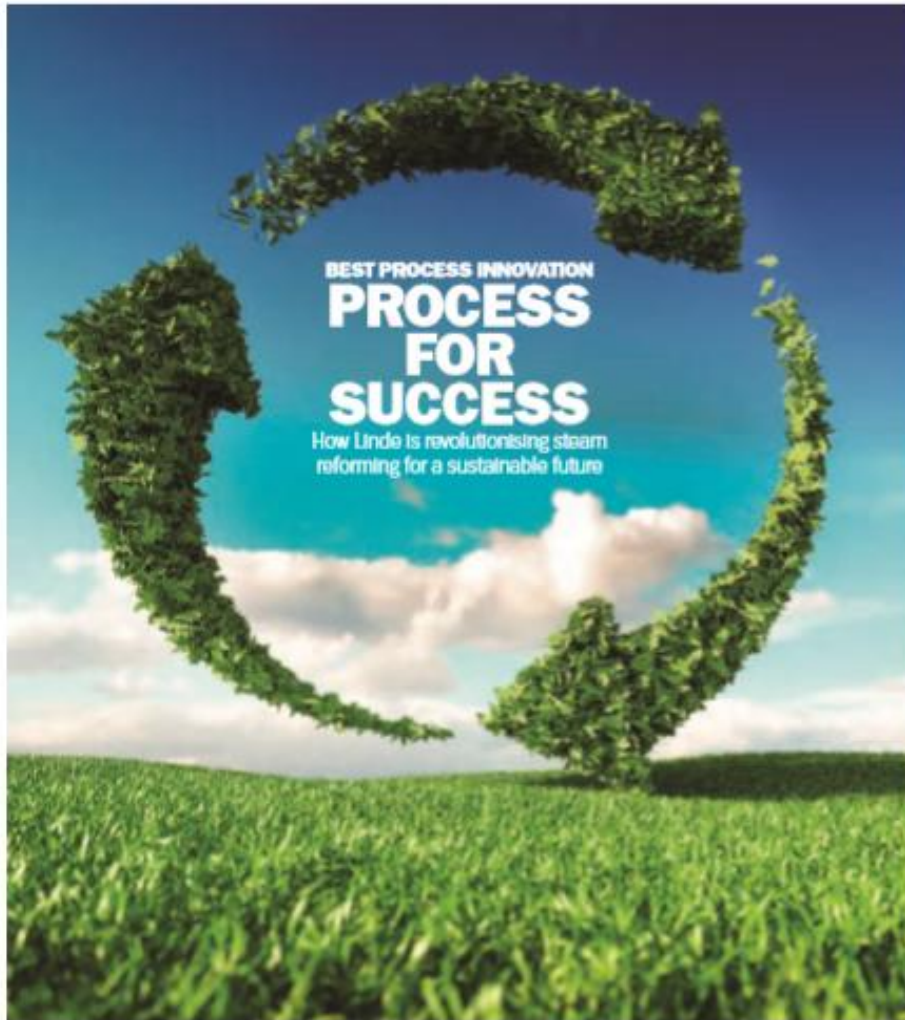


Innovation Awards 2019



Carbon Cycle finds clean solution

Carbon Cycle did not initially set out to develop a process to clean up gypsum. The company was working to develop a carbon capture and utilisation process to convert gypsum into chalk for use as a white filler to make paper.

The process requires clean white gypsum but, as this is in short supply, they turned their attention to cleaning “dirty” gypsums in order to create fillers with a high level of purity.

“Experts told us it was impossible,” said David Sevier, director of Carbon Cycle Limited. “The industry had been trying to solve this problem for a hundred years.”

After two years of work, the team tried something completely new. “It was like turning a switch,” said Sevier. “Suddenly we could take a very dirty product and produce bright white material.”

The PureGyp mineral purification process created a commercially viable means of purifying minerals such as chalk and gypsum for the first time. The process works by reacting gypsum with a complexing agent. It is quick and the reagents are recyclable, which keeps



PureGyp purifies gypsum for use as a high-level purity filler to make paper products

costs and damage to the environment down. The company began to get so much commercial interest that they ceased working on carbon capture and the focus is now on their PureGyp process, cleaning phosphogypsum.

The phosphoric acid production industry has a multibillion tonne waste and pollution problem, producing 300m tonnes/year of waste, most of which cannot be used due to high levels of impurities. It is stored in large waste stacks or discharged into the ocean presenting a risk for the local population and the environment.

The demand for clean gypsum for cement and plasterboard production runs at 280m tonnes/year and rising.

The process could also meet another global need for rare earths, essential for making wind turbines, electric motors, batteries and electronics. Phosphogypsum can contain up to 1% by weight of rare earths, and the company is now looking to unlock significant new supplies.

“The first step towards commercialisation is to build a pilot plant which is in progress,” says Sevier. “But the main challenge now is that we simply need more investment.” ■