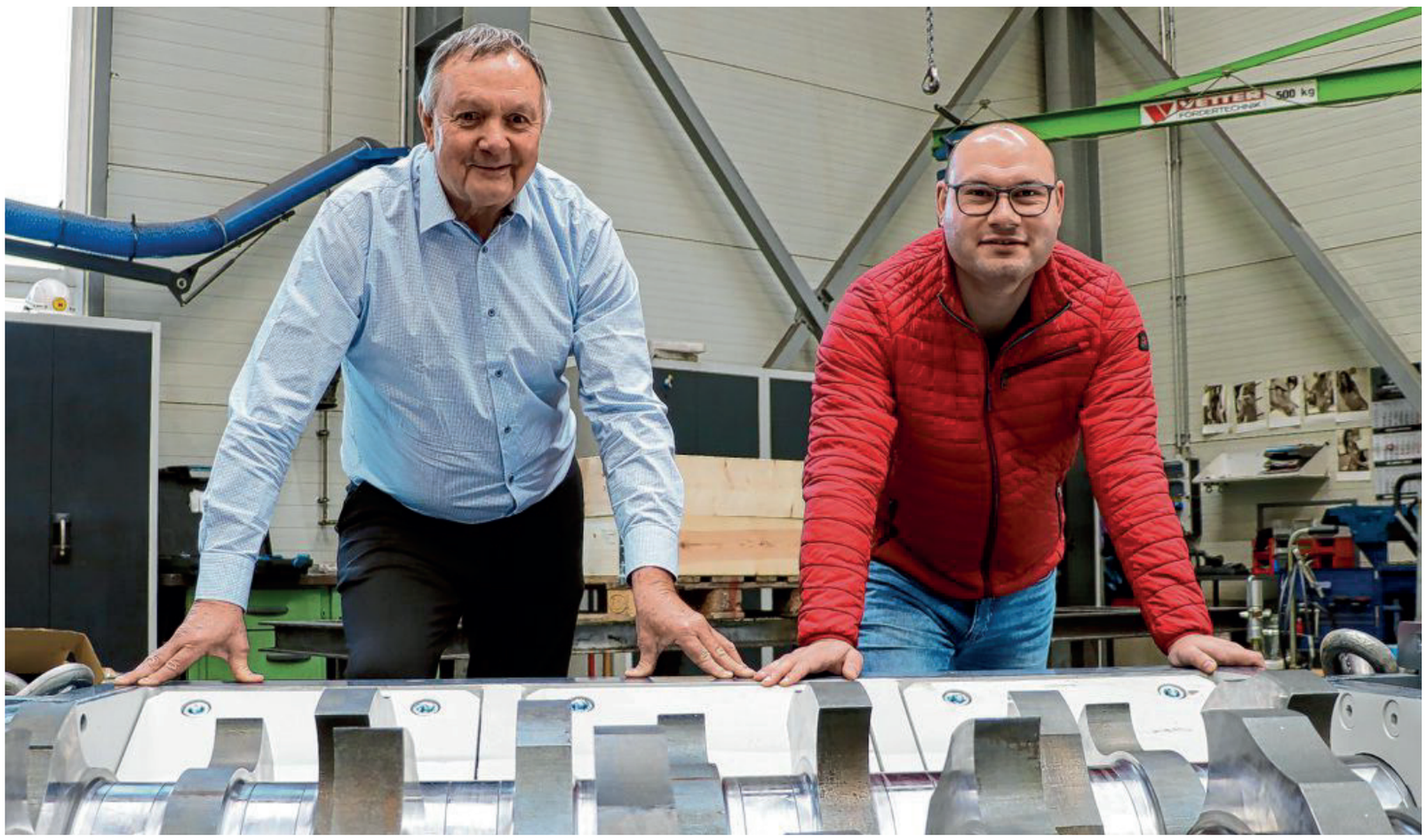
The shredding professionals

Whatever enters the machines at Erdwich is broken down into thousands of pieces. The process forms the basis for recycling refrigerators, electric car batteries and more. Orders come in from all over the world.

By Michael Kerler



Neither old refrigerators nor cast steel stand a chance in Erdwich's shredding machines. According to senior partner Hans Erdwich (left) and sales manager Maximilian Gutmayr, this is the basis for recycling. Photo: Michael Kerler

Igling At some point, even the most modern electric car will reach the end of its life. And then the question arises of how to recycle it, especially its battery, which contains valuable raw materials such as lithium, cobalt, steel and plastics.

There is a high probability that your search for solutions will lead you to a medium-sized company in Bavaria, Erdwich, based in Igling near Landsberg am Lech.

The family-owned company specialises in the manufacture of shredding machines and the processing and recycling of electronic waste and other recyclable materials – things that our society produces in large quantities today. 'Our machines and systems are represented in almost a hundred countries,' says Hans Erdwich, 73, long-standing managing director of the company, which has 45 employees. According to its own information, Erdwich ranks among the world's top three companies in the processing of refrigerators and electronic waste.

The company is proud to be able to contribute to environmental protection.

To understand what the company specialises in, it is best to go down to the production floor with the senior manager. Here, beneath the large cranes capable of lifting 30 tonnes, employees construct components for the turbines, some of which are up to 70 metres long. The heart of the equipment: a shaft, usually two or three metres long, to which thick steel blades are attached. When the blades interlock, they create an impressive shredder.

Whatever slips into this device doesn't stand a chance. Electric motors, discarded electrical appliances and old washing machines are bursting. Shredding is only one step in the recycling process, but it is essential for loosening, separating and returning tightly screwed, welded or glued materials to the raw material cycle. Magnets fish out metal after shredding, air currents separate non-ferrous metals and plastics, and chemical processes bind pollutants. Statistics from 2022 show that over 60 million tonnes of electronic waste are generated worldwide today. 'Recovering raw materials from electrical and electronic waste is one of the greatest challenges of our time,' says Hans Erdwich. He is convinced that he can offer solutions for this.

The company was founded in 1972 by his father, Johann Erdwich, as a specialist in drive and conveyor technology in Kaufering. 'My father was a developer and inventor,' recalls his son.

The first customers are hotels and restaurants that need to reduce waste volumes, whether cardboard boxes, fruit crates or cans. 'In the 1980s, the concept of recycling became increasingly important, and there was a search for plants that could not only shred waste but also return recyclable materials to the cycle.' Customers include companies such as Siemens, BMW and Audi. Many factories, for example, produce large quantities of metal shavings. These are crushed and can then be reused as recyclable material.

Soon, in the 1990s, even more demanding tasks await the specialists, including the shredding of old refrigerators. Refrigerators are problematic because for many years, CFCs, which are harmful to the Earth's ozone layer, were used in the insulating foam and as a refrigerant. Erdwich develops a plant that captures CFCs and recovers the raw materials. To do this, the fittings are first removed from the discarded refrigerators and the compressors are taken out. The refrigerator is then placed in a closed, gas-tight facility and shredded. Iron, non-ferrous metals and plastics are sorted in several stages, and the insulating foam is finely ground to release the CFCs. Activated carbon binds the gas, which can then be disposed of in an environmentally friendly manner. Erdwich supplies turnkey refrigerator recycling plants worldwide. 'Our largest plant is located in Switzerland, producing 200 refrigerators per hour,' reports Hans Erdwich. Hans Erdwich is a trained banker. In 1989, he took over the management of the company from his father. The company's machines shred waste at the Schneefernerhaus on the Zugspitze or at an observatory in Chile at over 4,800 metres. They cut up cast iron parts in car factories or chips on ships laying gas pipelines. Internationalisation has paid off for Erdwich: in Hong Kong, for example, Erdwich has built a recycling park for electronic waste. The former British Crown Colony generates 56,000 tonnes of electronic waste per year. For the construction, 86 40-foot containers full of machinery were shipped to Hong Kong. Today, eight plants are in operation there, shredding and sorting old refrigerators, LED screens and other electronic waste.

> Whether it's smartphones or electric cars, batteries are causing problems.

The old location in Kaufering eventually became too small, and in 2017 the company moved into a new building in the industrial area in Igling. Eleven engineers now work in the planning office. Down in the hall, there is flexing, welding and grinding. It is classic mechanical engineering that takes place here, 'Made in Bavaria'. There is a wide variety of items that need to be shredded, ranging from discarded toasters and washing machines to solar panels and worn-out artificial turf from sports fields. Battery recycling poses a particular challenge.

Whether smartphones, e-bikes, electric cars or truck batteries weighing up to 800 kilograms: recycling lithium-ion batteries poses a number of problems. Firstly, if the batteries are not discharged, there is a risk of fire and explosion. Secondly, the batteries contain toxic materials. The company's solution: the batteries are hermetically sealed from the outside world, broken open in a nitrogen atmosphere and processed in several steps.

Specialised chemical companies are interested in the black powder contained in batteries – also known as black mass – because it can be used to recover rare raw materials such as lithium, cobalt, copper, nickel and manganese. 'Battery recycling is high-tech,' says Erdwich sales director Maximilian Gutmayr. The company has now built plants in Lower Bavaria, Portugal and Romania. And the challenges are growing: 'Today, we are disposing of the generation of batteries that existed eight or ten years ago. In ten years' time, we will be confronted with today's batteries and significantly higher energy densities,' he says.

Erdwich is convinced that they will not run out of work anytime soon: 'Consumers hardly ever have broken items repaired anymore; they just throw them away and buy new ones,' Hans Erdwich has observed. He has travelled the world. Prosperity is increasing, but in many countries, waste from this prosperity is still too often dumped into rivers or disposed of in the environment. 'It hurts to see what we are doing to the earth,' he laments. In industrialised countries, the importance of recycling has increased since the 1990s and 2000s. Europe, which is poor in raw materials, can recover scarce resources through recycling. 'We cannot save the world with our company, but we can make a contribution with our expertise in the construction of recycling plants,' Hans Erdwich is convinced.

Meanwhile, the third generation has taken over with son Harald Erdwich, 43, and Florian Böhm Feigl, 41. 'Our order books are full,' says senior boss Hans Erdwich. The company generates more than 15 million euros in annual sales. 'We have never laid off an employee, even in difficult times,' he explains. Today, he is looking for project and sales engineers as well as skilled workers and fitters.

The company now generates over 70 per cent of its turnover internationally. And there could be even more to come: 'The potential is huge,' says Hans Erdwich. 'Many countries are only just starting to collect waste and recycle.'

Bavaria's motivators

Bavaria's companies face many challenges: energy is expensive and skilled workers are scarce. But many entrepreneurs are forging ahead and creating innovation together with their employees. In this series, we present 'Bavaria's motivators'.