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From the onset, BR Metals differentiated itself by acquiring state-of-the-art analytic equipment and continuously improving on proven analytical methodology for quick, accurate analysis of PGM content in sampled materials whilst providing a one-stop, hassle-free recycling solution. PHOTO: BR METALS

## SUPPORTING A CIRCULAR ECONOMY

For recycling firm BR Metals, there is no such thing as waste. After it extracts precious metals from discarded catalytic converters, electronics and other scraps, it makes sure all the by-products get a second life too.



It sells the catalytic converters' metallic shells to licensed scrap metal dealers for recycling and upcycling and gives the electronics' plastic casings to licensed plastic waste collectors. "We adhere strictly to a zero-landfill policy," says founder and managing director Frank Chen.

The precious metals are sold to refineries that, in turn, ensure their reuse. He added: "We use different refineries for different grades of metals for the best possible outcomes."

# BR Metals combines profitability with sustainability

Adaptability and commitment to innovation have been the keys to success for this recycling powerhouse

By Feng Zengkun

When Mr Frank Chen started his recycling business BR Metals in 2009 to recover platinum group metals (PGM) – precious metals such as palladium, platinum and rhodium – from scrap materials, he had two objectives in mind – to offer a more sustainable alternative to environmentally damaging mining and to meet a growing market demand for professionalism and transparency in the recycling of these precious metal scraps.

He was also driven to "democratising" the business by transferring the same level of service, know-how and customer care offered by established refineries to often-neglected smaller suppliers.

This year, the firm has been recognised yet again as one of the fastest-growing companies in Singapore in a list compiled by The Straits Times and global research firm Statista – the third time in a row it has earned a spot on the annual top 10 list.

Between the 2016 and 2020 financial years, its revenue soared from US\$4.8 million (S\$6.3 million) to US\$130 million (S\$172.5 million), and it now has two processing facilities, in Shaoguan, China, and Singapore, as well as offices in China, Singapore and Cambodia.

"Despite the Covid-19 outbreak, we have continued to grow and prosper, and I think that is a testament to how we've managed our business relationships and developed our company," says Mr



Parts like catalytic converters found in vehicles are efficiently recycled, and metals like platinum and rhodium are extracted as a result. PHOTO: BR METALS

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Mr Frank Chen, founder and managing director, BR Metals.



Chen, who is the firm's founder and managing director.

### Achievements through automation

Over the years, BR Metals has invested in automation as a key pillar of its success.

When scrap materials arrive at its processing facilities, they are put through machines that crush them into fine particles and mix and homogenise them to produce samples for analysis.

"Before we automated this process, our employees had to walk around and press buttons on the

machines to activate them. They also had to adjust the air flow in the machines manually depending on the materials' weight, among other work," Mr Chen says.

To cope with the growing volume of incoming materials, the company installed sensors and programmable logic controllers to automate the entire process, increasing productivity and keeping a lid on labour costs.

In Singapore, for example, automating the sampling line slashed each production cycle's time by 72.07 per cent, electricity use by 48.26 per cent and costs by 38.15 per cent.

The company has also turned to robotics to analyse the samples, which is done to determine the scrap materials' PGM content for payment to suppliers.

It set up laboratories in both processing facilities to study the ideal types and amounts of chemicals to use on various samples. "We now have robotic arms that can go into test tubes, take chemicals as instructed and dispense them and repeat this over and over again," he said.

By relying on robotics, the firm reduced its analyses' error rate from about three per hundred samples to about three per thousand samples. "This is very important to us because reliable analysis is a crucial part of our business," he says.

Taking stock of the company's automation journey, Mr Chen muses: "We're recovering about four to five tonnes of PGM per year now, and without these investments, we would probably be able to achieve only half of that."

### Diving into diversification

Far from resting on its laurels, BR Metals is also looking ahead to secure its future.

So far, it has concentrated on recycling PGM found in discarded catalytic converters from petrol- and diesel-powered vehicles.

To add new growth engines, it is diversifying into recovering

metals, including silver and gold, from electronic waste and jewellery scraps in Singapore.

It recently constructed a new sampling line for electronic waste in its Singapore facility, and is salvaging metals from computer motherboards, with lower-grade boards, such as those from car in-vehicle units, next in the pipeline.

"We've processed two shipments of electronic waste and are getting more materials in so that we can refine our sampling and analysis for the waste, just as we did for the catalytic converters," Mr Chen says.

The firm will also expand into the industrial sector in the near future. "When you make solar panels, you paint silver onto silicon and workers use wipes to clean the excess silver off the panels. We want that silver from the wipes," he explained.

He noted that diversification will stand the company in good stead through fluctuations and long-term changes in any of its waste streams, for example if fossil-fuel vehicles eventually give way to electric ones.

"We're always thinking about how we can be bigger, better, faster and more cost-effective," he says.

### Patents and partnerships

Mr Chen is also resuming research partnerships interrupted by the pandemic.

BR Metals and the Singapore Institute of Technology (SIT) have resumed joint research to develop a faster and more efficient method of PGM analysis.

The company is also forging ahead with patent applications in China. It has two patents and is applying for three others. "We're not inventing machines from scratch, but putting together commercially available equipment and parts to improve our sampling lines," Mr Chen says.

Finding ways to give back to the community is another priority. BR Metals gave a scholarship and a bursary to lower-income students from SIT and the Nanyang Academy of Fine Arts in 2019 and last year respectively, and Mr Chen wants to do more.

"We have grown a lot and are in a position to do good, and education is something close to my heart," he explains.

"Moving forward, we want to build on our momentum and grow our business even more, so we can do more for the environment and for the community."