

MICROWAVE PROCESSING OF ORES - COMMERCIAL REALISATION OF A STEP CHANGE FOR THE MINERALS INDUSTRY

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ABSTRACT

As ore bodies age and grades decline, increasingly higher embodied energy input is required for comminution to maintain production, which increases costs and the carbon footprint of these operations. A step-change in energy reduction is required to meet the future demand of these processes. Microwave technology has long been suggested as a route to significant energy reduction and enhanced recovery in mineral processing. Until recently, however, the work was at an academic level with little or no vision for deployment in the mining industry.

We present for the first time a defined pathway to commercial application of microwave technology for the mining industry. This builds on our previous work which has successfully demonstrated this technology at over 150 t/hr. We consider the integration of microwave engineering with bulk solids handling at scale and also present details of a route to commercial delivery. We will focus our paper upon the value proposition that this technology can deliver. In particular, we consider the impact of induced fractures on conventional grinding/flotation circuits, on the performance of leach systems and on new flowsheets with the potential to deliver a paradigm shift in carbon emissions from mineral processing circuits.

Keywords: comminution, microwaves, carbon footprint