Environmental and Cost Comparison of Different Spodumene Concentration Processes

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# ABSTRACT

The world needs more raw materials for the growing sustainable economy, for lithium it is expected that the demand will increase by 400% by 2050. Few know the variability in the environmental impacts and costs of existing and emerging raw material production assets, and it is expected that when using the same technology for lithium production, costs and environmental impacts will only increase as the highest quality resources are currently being mined.

FLSmidth (FLS) has been looking into alternative methods for spodumene concentrate production as part of the lithium shake-up project. Minviro and FLS have worked together to understand the climate change and water use impacts and costs of producing spodumene concentrate via the lithium shake-up project, in comparison with conventional wet stack and dry stack lithium processes. As part of this process, three different flow sheets were compared.

The FLS Shakeup option (vertical roller mill with dry stack tailings) has a clear potential for reduced climate change and water use impacts whilst in parallel, having lower costs compared to conventional production with dry stack tailings and marginally higher costs compared to conventional production with wet stack tailings. This suggests that the flowsheet developed by FLS as part of the lithium shake-up project is a superior option, especially in light of emerging carbon penalties, taxes and sustainability concerns.