

# SLIM - SUSTAINABLE LOW IMPACT MINING SOLUTION FOR EXPLOITATION OF SMALL MINERAL DEPOSITS BASED ON ADVANCED ROCK BLASTING AND ENVIRONMENTAL TECHNOLOGIES

## IMPROVING BLASTING PERFORMANCE, REDUCING ENVIRONMENTAL SIDE EFFECTS AND ASSESSING THE RESULTS WITH STATE OF THE ART TECHNOLOGY

The EU H2020 funded SLIM project was successfully completed on October 2020. In this project the chair of mining engineering contributed to assessing blasting performance, with special regards to vibrations, and measuring mining related key performance indicators (KPIs) based on changed blasting design.

During the project vast amounts of data on the mining process, including drilling & blasting, loading, hauling, and crushing of the material. This could be achieved with new digital technologies, suitable for observing the operations on a 24/7 basis with almost 100 % reliability, and algorithms suitable for detecting specific unit operations for further processing. The data show how geology, different ore types, and blasting methods influence downstream

processes. As a general conclusion we can say that while crushing energy consumption is comparably strongly linked to upstream changes, loading (the ease of digging the material) depends on many more parameters, mainly geometry of the bench and wheel loader operators.

Additionally, extended work on image recognition with a special emphasis on grain size distribution was performed and linked to the above mentioned KPIs. Now, innovative algorithms are available reliably assessing the particle size distribution of a muckpile, as well as on the dump-truck.

The outputs of the project resulted in a range of scientific publications, and presentations at high-level international conferences, as well as Master's and Bachelor's thesis.



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