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Currently excavated material from tunnel construction in EU countries and Switzerland is treated as “waste”. In accordance with applicable law, waste is to be disposed of if it is not sent to the end of the waste. The process to obtain the end of waste is not followed in most cases, as it is administratively and technically demanding and is therefore associated with considerable costs. As a result, the use of excavated material is currently not economically viable in most cases. Due to the high volumes of “mineral raw materials / waste” from underground infrastructure projects and the associated landfill areas required, innovative measures are required in order to initiate sustainable change in this regard.

FCC is geologically in the middle of the Molasse. The “molasse sediments” extend from the French Alps via Switzerland to Austria. Preliminary explorations revealed six different types of heterogeneous sedimentary rocks around the FCC tunnel project.

So far there is no industrial application for molasses sediments. As part of the FCC tunnel project, 9 million m³ of rock would have to be deposited. In order to create new ways of using excavated material from tunnel construction, CERN has started the EU project FCC-IS.

As part of the research task “Mining the Future” at CERN, an international competition is being held. The competition aims to help identify innovations for the use of excavated materials. The aim is to make future underground construction projects both more resource-efficient and more cost-efficient and to strengthen European industry.

At the Chair of Subsurface Engineering at the MUL, a large number of tests are carried out in the geotechnical laboratory, which are used for tunnel planning on the one hand, but also for the use of the material on the other. Dipl.-Ing. Maximilian Haas, employee at CERN and a graduate of Montanuniversität Leoben, Austria selected all samples; furthermore he worked in the laboratories of the University of Geneva and at the ETH Zurich as part of his dissertation on the chemical and mineralogical composition of the expected tunnel excavation material.

If we succeed in reversing the trend towards the mandatory use of tunnel excavation material, if this is not technically impossible, and thus giving this topic higher priority, an important step would be achieved.

The development of economically viable routes for innovative tunnel construction enables a significant reduction in the excavated material to be dumped. The business plan won from the competition for the use of the “molasses sediments” is intended to serve as an example for other projects. Due to the disclosure of all data, this should create a basis for new pilot projects.

In autumn 2022 a seminar and the award ceremony for the competition to find the most innovative proposals for tunnel excavation recovery will take place at ZaB – Zentrum am Berg, a large scale underground research facility in Austria.

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