## **Current Research Projects**

Here you will find an overview of our current publicly funded research projects, grouped alphabetically. In addition, the AMT implements projects on a private contract basis together with industrial companies, which, however, cannot be listed here for reasons of confidentiality of the research subject.

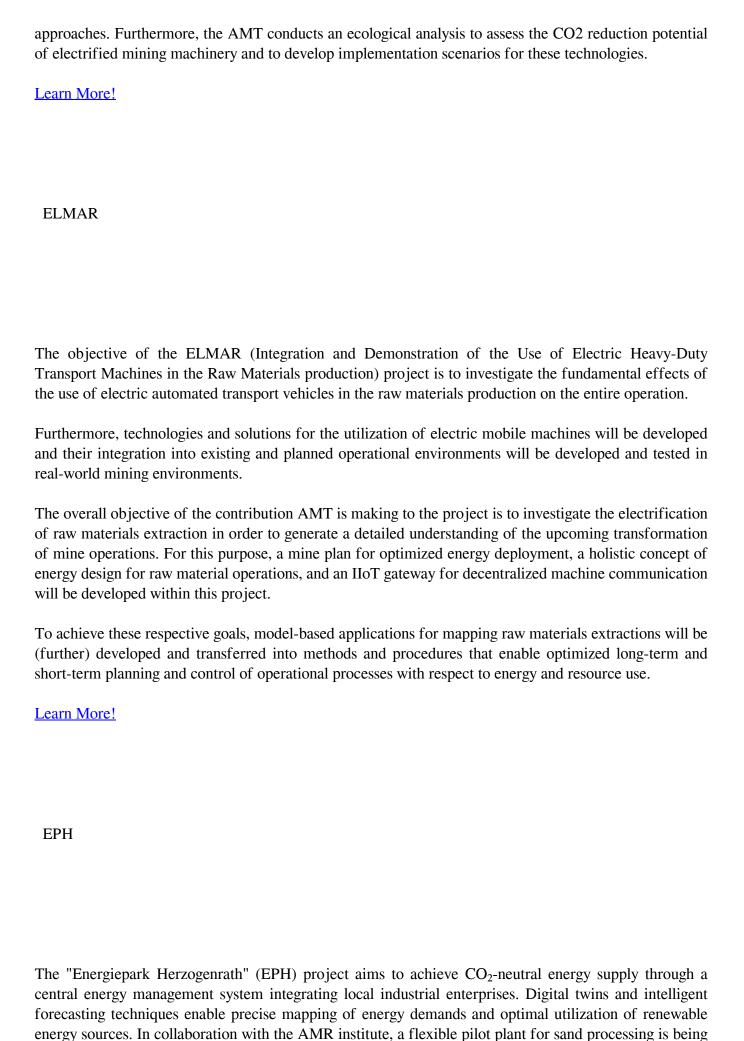
**AKUSTAHL** 

The aim of the AKUSTAHL project is to develop a monitoring system using acoustic emission analysis (AE analysis) for the micro and initial crack prediction of steel structures subject to fatigue loading, such as bridges, cranes, offshore or industrial structures. Existing systems for acoustic emission analysis are thus to be expanded to include the measurement and detection of microcracks for the earliest possible detection of damage events.

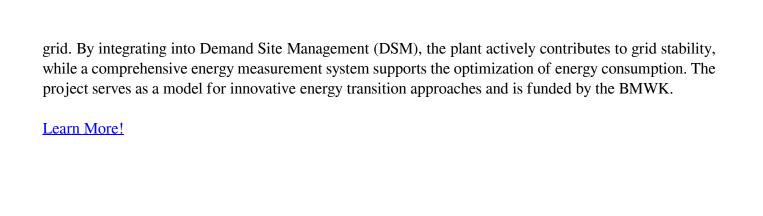
Learn More!

AREA.AI

The AREA.AI project explores opportunities to enhance the safety and sustainability of resource extraction through the development of a robust, low-emission, and autonomous transport system. The AMT focuses on ensuring safety in both autonomous operations and mixed traffic scenarios by investigating regulatory and operational requirements. It researches and develops necessary collision avoidance systems and Human-Machine Interfaces to ensure operational safety. Additionally, it evaluates communication technologies in mining, including optimizing wireless networks and developing simulation



developed, continuously collecting energy and process data while dynamically adapting to the local energy



**REESOURCE** 

Welcome to Project REESOURCE: "UNLOCKING THE SUPPLY OF RARE EARTH ELEMENTS IN EUROPE THROUGH RESPONSIBLE, SUSTAINABLE AND DECARBONISED INNOVATIVE TECHNOLOGIES"

Project REESOURCE aims to revolutionise the mining of Rare Earth Elements (REEs) in Europe, leveraging a world-class deposit in Norway with a multi-generational lifespan. This initiative focuses on ensuring a stable and sustainable supply of REEs, critical for green technologies, while adhering to principles of responsibility, sustainability, and reduced carbon emissions. Central to this endeavour is the innovative "Raise Mining" method, enabling "Invisible Mining" by minimising socio-environmental impacts.

A key challenge in this project lies in managing the safety hazards posed by radioactive minerals often associated with REE deposits. Effective mine ventilation is essential to mitigate these hazards by diluting radioactive isotopes and maintaining safe occupational conditions. The Advanced Mining Technologies (AMT) team is tasked with developing ventilation guidelines and a hybrid simulation model combining VentSim and CFD/Ansys. This approach will provide a digital design framework to optimise ventilation parameters, ensuring energy efficiency and adherence to regulatory safety standards.

Learn More!