

## **Current Research Projects**

Here you will find an overview of our current publicly funded research projects, grouped according to the Smart Services corresponding to the data information value chain, which you can find in the overview of our research focus areas. 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.

### **MINE DESIGN AND ENERGY MANAGEMENT**

#### **ELMAR**

The objective of the ELMAR (Integration and Demonstration of the Use of Electric Heavy-Duty Transport Machines in the Raw Materials production) project is to investigate the fundamental effects of the use of electric automated transport vehicles in the raw materials production on the entire operation.

Furthermore, technologies and solutions for the utilization of electric mobile machines will be developed and their integration into existing and planned operational environments will be developed and tested in real-world mining environments.

The overall objective of the contribution AMT is making to the project is to investigate the electrification of raw materials extraction in order to generate a detailed understanding of the upcoming transformation of mine operations. For this purpose, a mine plan for optimized energy deployment, a holistic concept of energy design for raw material operations, and an IIoT gateway for decentralized machine communication will be developed within this project.

To achieve these respective goals, model-based applications for mapping raw materials extractions will be (further) developed and transferred into methods and procedures that enable optimized long-term and short-term planning and control of operational processes with respect to energy and resource use.

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### **AUTOMATION**

### **MINE SAFETY**

## HEET II

The HEET II project aims to develop the innovative high efficiency power system for machines and devices, increasing the level of work safety in underground mining, in potentially explosive conditions such as coal mines. The system will consist of four critical subsystems:

- transmission of electricity with single-wire technology,
- transmission of electricity with wireless technology,
- integration of the rail of the suspension monorail and
- monitoring and control system of the power supply network.

The AMT will implement a platform to monitor the parameters of the system and the environment and send them to the surface of the mine. These subsystems will be developed and implemented by a collaboration with an interdisciplinary consortium from Germany, Poland and Romania.

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