

Engineering

En

Performance

Pe



## Ovoot Coking Coal Project

Aspire Mining Limited

TUV NORD GROUP

# Agenda



**01**

**DMT AT A GLANCE**

**02**

**MARKETS & PROJECTS**

**03**

**PRODUCTS**

**03**

**INNOVATION**



**01****DMT AT A GLANCE**

- DMT as part of the TÜV NORD GROUP
- History
- Our Attitude
- Engineering Performance
- Facts & Figures
- Business Units
- Proof of our Performance
- Locations and Availability
- Associations and Networks
- Selected Customers

# DMT as part of the TÜV NORD GROUP



## TÜV NORD GROUP

Headquarters in Hannover, Germany



Industrial Service,  
Mobility, Education



Engineering and Natural Resources



Aerospace



Information Technology

# History



1700

2000

today

**1737 - 1990**

Various predecessor organisations

**1990**

Foundation of DMT

**2006**

Acquisition of IMC and foundation of DMT Czech Republic

**2007**

DMT joins the TUV NORD GROUP

**2008 - today**

Further international growth by acquisition and foundation of 14 companies

# Facts and Figures



We create **sustainable value** for our customers through **quality-assured, specialized and innovative services in engineering and consulting.**



We provide independent services in the areas of **civil engineering and infrastructure, industrial plant engineering, natural resources, plant & product safety.**



DMT's **roots** date back to **1737**



Approx. **1,100 employees** mainly with academic background



DMT comprises **14 operational engineering and consulting companies and more than 30 branches worldwide**



DMT's attitude is dedicated to **excellence, responsibility & innovation**



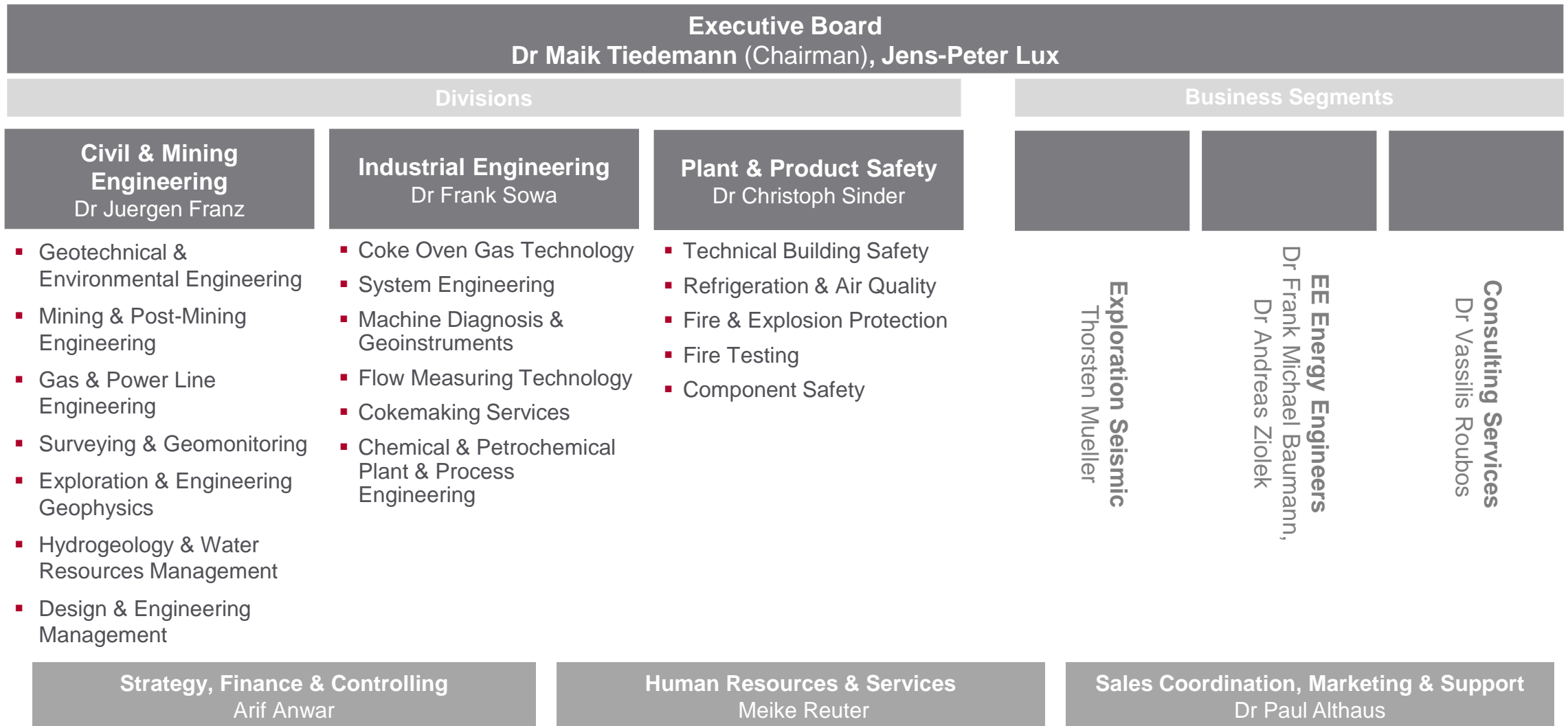
Approx. **€ 130 million turnover**



Today **DMT** is a **core brand** of **TÜV NORD GROUP**

# Business Unit Engineering & Natural Resources of TÜV NORD AG

## DMT Group



# Proof of our Performance



## Worldwide on site

30 German and international locations



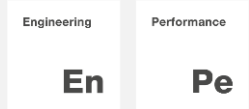
## >10,000 Projects

annually in more than 150 countries



## Added Value

High customer satisfaction through engineering performance



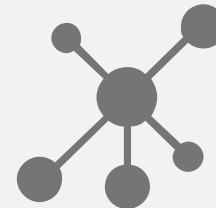
## Practical experience and certification

- ISO 9001
- ISO 14001
- SCC<sup>P</sup>: 2011



## Highly networked


in all relevant committees, associations and networks worldwide



## 360° Service

Cross-interface from analysis to approval



**>40**   
current research projects



# Proof of our Performance – Certificates



- ✓ ISO 9001
- ✓ ISO 14001



- ✓ SCCP: 2011

Furthermore, DMT group makes use of about 20 of its own accredited testing laboratories and expert bodies.

## Locations and Availability – International Presence

### Local representations

1. UK
2. India
3. Peru
4. Canada
5. Indonesia
6. South Africa
7. Turkey
8. Australia
9. Middle East
10. Kazakhstan



# Projects all over the World

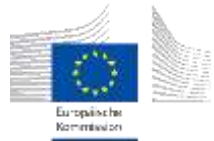


**Thousands** of projects in  
> **150** countries

# Associations and Networks (Excerpt)



# Selected Customers





# Selected Customers



**02****MARKETS & PROJECTS**

- Civil Engineering & Infrastructure
- Mining
- Energy
- Plant Engineering & Process Engineering
- Cross Market Services: Plant & Product Safety



## Focus Markets



**Plant Engineering & Process Engineering**



**Civil Engineering & Infrastructure**



**Mining**



**Energy**



## The Goal

Understanding process dependencies at the highest technical level and ensuring the highest efficiency with maximum security

## Our Way

- From consulting, testing and evaluation to planning, construction remediation and repair
- Highest efficiency with maximum security
- Supply of systems or core components
- Process engineering
- Basic and detail engineering
- Refurbishment concepts & studies
- Installation & commissioning
- Training of operating personnel

A wide-angle photograph of an industrial plant at night, illuminated by numerous lights. The plant's structures, including tall distillation columns and piping, are reflected in a body of water in the foreground. The sky is a deep blue, suggesting twilight.

**From design to launch,  
you can build on  
experience.**

## Delivery of a turnkey high-pressure gas cleaning system

### Central coking plant Saar Germany

- The coke oven gas from the coking plant is cleaned of impurities in the plant and then fed to the chemical industry via a long-distance gas network. In order to be used as combustion gas, a high degree of purity of the gas must be achieved
- DMT is planning, supplying and installing a high-pressure fine gas cleaning system consisting of a compressor, high-pressure hydrogen sulphide scrubbing and -BTX scrubbing with several heat exchangers as well as the supporting steel structure and connecting piping
- Commissioning by DMT is planned for 2020





## Construction of a coke oven gas desulphurization plant

ArcelorMittal  
France

- The French coking plant Dunkerque had previously been operating without a facility for the desulphurization of coke oven gas.
- Basic engineering and plant construction of the desulphurization plant by DMT
- Resulting in enhanced environmental protection



## Delivery of a gas treatment plant in cooperation with Paul Wurth

PT.Krakatau Posco  
Indonesia

- Process Engineering
- Detail Engineering
- Delivery
- Commissioning and acceptance



## Methane utilization from coal deposits and weather current

Among others RWE, Evonik, MAN  
Worldwide

- Technical risk assessment of methane utilization
- Forecast of CH<sub>4</sub> inflows to generate CO<sub>2</sub> credits (Kyoto Protocol)
- Basic engineering for gas utilization
- Optimization of gas extraction and ventilation





Where high expectations meet profound understanding.

## The Goal

The mining business is complex, demanding, and requires great investments. As one of the leading mining service groups in the world, we have been passing on our experience in the consulting, financial, and engineering areas since 1737.

## Our Way

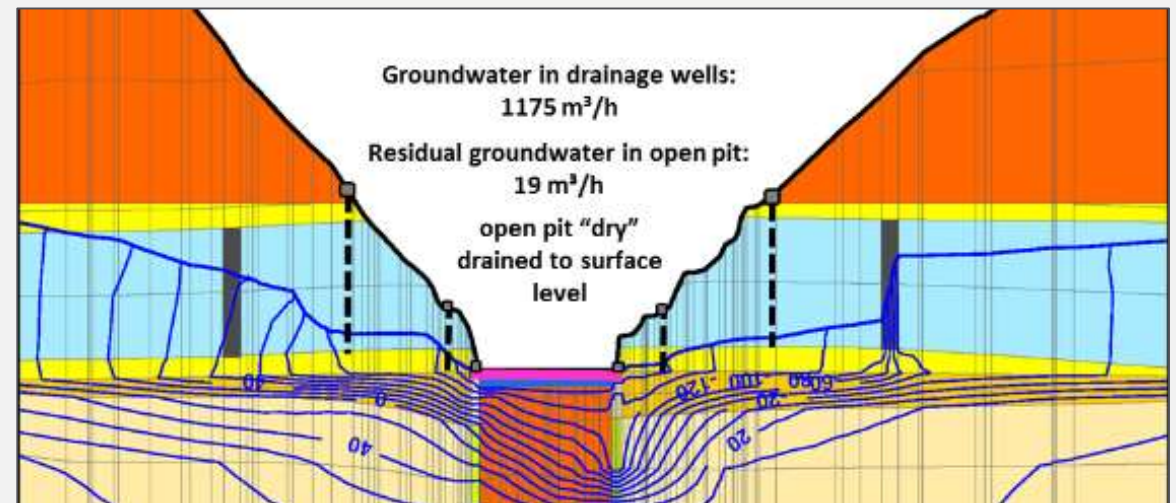
- Engineering and consulting along the whole life cycle of a mine
- Evaluation
- Deposit modelling
- Investment studies
- Greenfield development
- Mine planning
- Beneficiation
- Mine closure



## Concept study for the sealing of a flooded diamond mine

Alosa, Russian Federation  
Russia

- Situation: Water ingress into the underground mining below the open pit. Excavation rock salt, flooded (total loss). Mine in central Siberia is to be reactivated. Reserves: >3 billion \$
- Permafrost up to 750 m below GOK
- Mighty aquifer (>1,250 m<sup>3</sup>/h) in open-cast mining
- Creation of a groundwater model
- Development of a concept study for the sealing of the opencast mine to protect it from further water inflows
- Requirement of further complex planning steps





## Feasibility study for the expansion of an iron ore mine to double its capacity to 10 Mt/year iron ore concentrate

Shougang Hierro Perú S. A. A.  
Peru

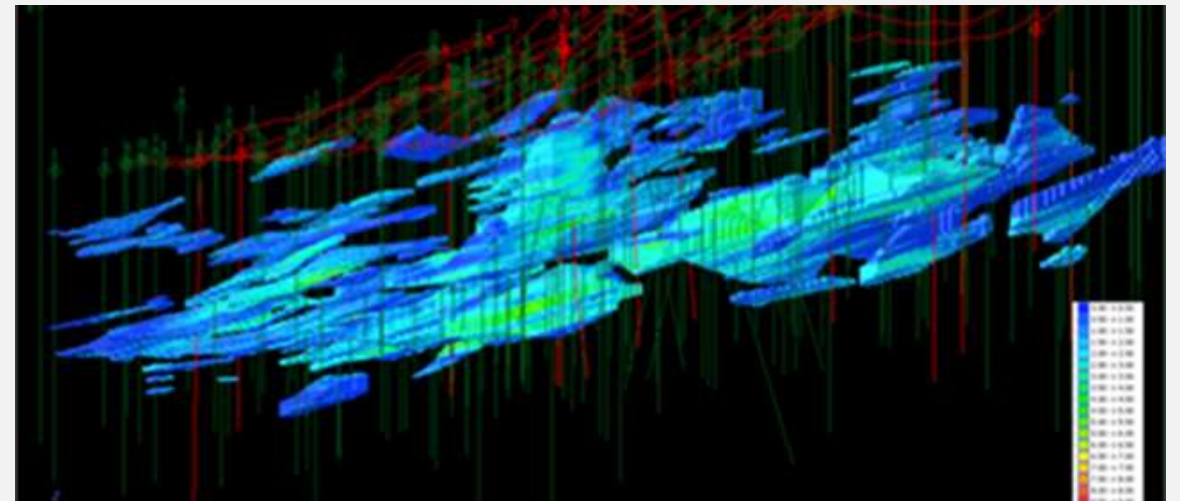
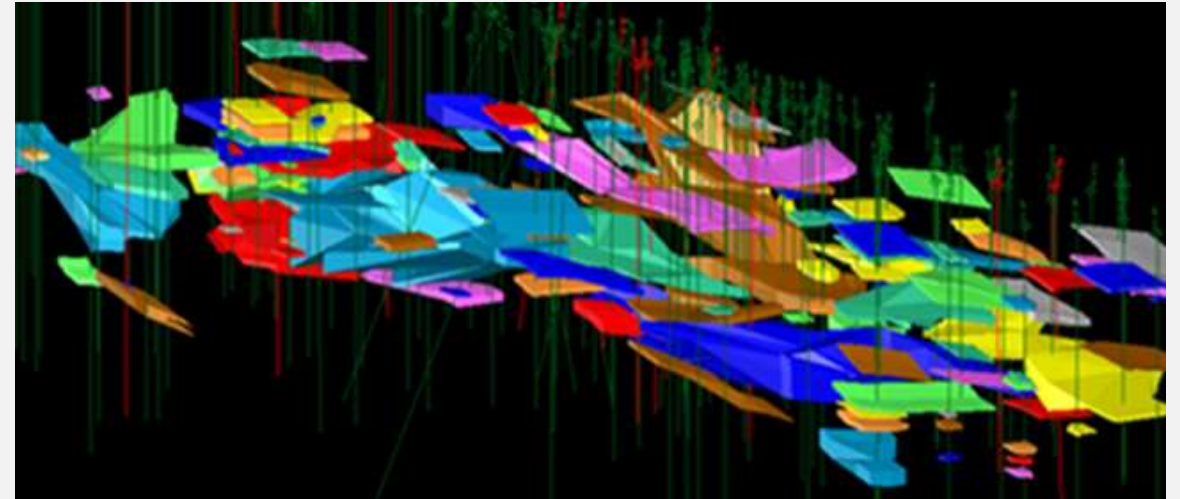
- Mine planning
- Incl. extraction planning, crushing plants, transport systems and tracks
- For an investment and feasibility study
- Project duration: 2 years



## Resource model for a copper mine project

### ASYA MADEN İŞLETMELERİ Turkey

- Resource estimation and feasibility study of a copper deposit
- Exploration drilling program > 50,000 m
- Assessment of the deposit using geoscientific, hydrogeological modelling techniques
- Feasibility, mining, process and environmental studies



## DMT Safeguard

Automated real-time integrity monitoring



Monitoring of potential integrity deficits of any objects for safeguarding environment, health, investments and operations

### Fields of application:

- Infrastructure
- Mining
- Plant
- Wind turbines
- Early detection of damage or defects

## Test Dusts

Test and standard dusts for various applications



DMT offers test and standard dusts as reference material for the dust pollution of products

### Fields of application:

- Ventilation of vehicle cabins
- Vacuum cleaner tests
- Determination of dust characteristics
- Development of special dusts

## SlimBoreholeScanner

For structural and geotechnical analysis



SlimBoreholeScanner is a tool for optical inspection and documentation of slim boreholes

### Fields of application:

- Structural analysis
- Geotechnical analysis
- Very narrow drill holes
- Inspection even of upward holes



## Selected Products



### PlantSafe®

Monitoring for plants & rotating equipment



DMT's machine diagnostic system specially designed for use in industrial plants

#### Fields of application:

- Industrial plants with a great number of monitored components
- Power plants
- Petrochemical industry
- Rolling Mills in the metal production

### WindSafe®

Monitoring for wind turbines



DMT's machine diagnostic system specially designed for use in wind power plants

#### Fields of application:

- Wind power plants
- Damage detection
- Reporting of abnormalities
- Use in rugged environments

### MineSafe®

Monitoring in mining & infrastructure



DMT's machine diagnostic system specifically designed for use in mining

#### Fields of application:

- Mining industry
- Infrastructure
- Early detection of damage or defects
- Condition monitoring of conveyor belt systems or water pumps

## Flow Sensors

Design, development & production



Tailor-made measuring technology for flow rate, mass flow rate and flow velocity.

### Fields of application:

- Aerospace
- Water management
- Landfill technology
- Nuclear power plants
- Chemical industry

## IMAGER 5006EX

Fast and accurate 3D scans



World's first explosion-proof 3D laser scanner for fast and accurate 3D scans of the surroundings.

### Fields of application:

- Safety inspections
- Accident & damage analysis
- Deformation analysis
- Geological rock face survey
- As-built documentation

## DMT CoreScan®

Core Scanning, digitalization & analysis



CoreScan generates high resolution, full-circumference images of drill core samples.

### Fields of application:

- Exploration drillings
- Sedimentological investigations
- Structural investigations
- Site investigations
- Geological investigations

**04****INNOVATION**

- Fields of Innovation
- Selected Research and Development Projects





# Strategic Fields of Innovation



## Geotechnics



## Energy



## Reengineering



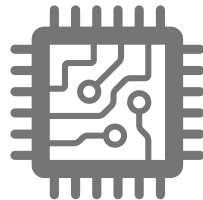
## Nuclear disposal



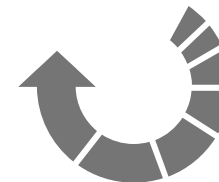
## Transparency



## Intelligent sensors



## Automation



## Water



## Mine Machine Maintenance

### MaMMa

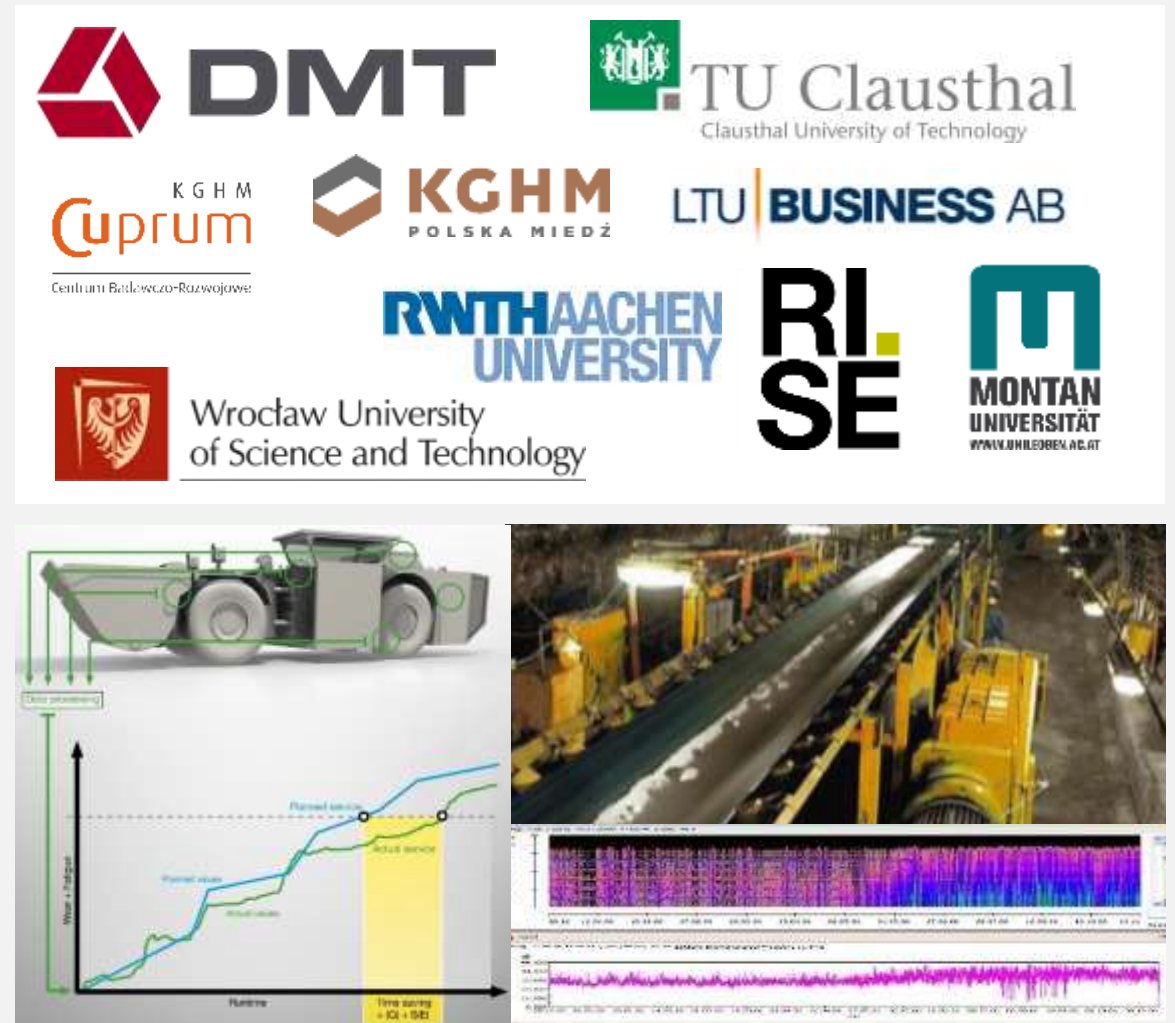


#### Product:

- Software for automated maintenance monitoring of mining machines for economic maintenance intervals.
- Updated DMT MyneGuard software with sensor geotags registered in maintenance database; compatible with IoT systems.

#### Result:

- Reduces cost for remote inspection mining technologies
- Validated in global coal industry applications (e.g. RAG, Longwall Caterpillar 2010-2015).
- No comparable system Ex-certified.
- Soon available as augmented reality (AR) visualization.



## Selected Research and Development Projects



### Automated Drill Core Scanning and Analysis

#### ANCORELOG



#### Product:

- Improved drill core scan technology add-on to the mobile CoreScan® instrument.
- Additional mineralogical and geochemical analytical technologies:
  - Hyperspectral visualisation of mineralogy contrast.
  - LIBS-RFA-RDA-MLA for geochemical major and trace element analysis and mapping of the drill core.

#### Result:

- Optimized automated DMT CoreScan® instrument for generating digital drill core libraries for exploration companies, geotechnical and geological surveys, and research institutes.





# Selected Research and Development Projects



## Mixed Reality Visualisation in Mining

### HOLOMINE



#### Product:

- Mixed reality visualization tool for mine machine maintenance, automated shaft inspection, and fire inspection.
- This innovative system can visualize in 3D the technical details of mine machines for purposes of predictive maintenance, mine shaft infrastructure for stability inspection, fire safety systems, and ore deposits.

#### Result:

- Enhanced safety and cost-saving predictive maintenance as well as technical training in safe mixed-reality environments, tangible 3D ore deposit visualisation for better ore deposit understanding and optimized mine planning.



## Real-Time Monitoring and Risk Assessment of Geotechnical hazards

### GeoHazCoal



Bundesministerium  
für Bildung  
und Forschung

**EUREKA**  $\Sigma$   
innovation across borders

**Canada**

### Product:

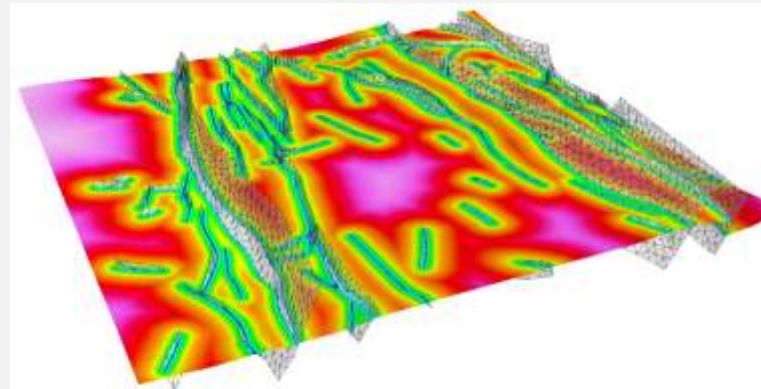
- GOCAD software module and Geoscience INTEGRATOR data management system for integrated geo-hazard assessment in coal mining, incl. machine learning, by fusion of heterogeneous data streams (incl. geometry of mine architecture, stress, seismicity, gas contents) into hazard probability assessment.

### Result:

- Real-time monitoring and risk assessment of geotechnical hazards (e.g. gas outbursts, rockburst, rock falls) to improve safety and production in European and Asian Coal Mining.



**Mira Geoscience**  
*...modelling the earth*





Engineering  
**En**

Performance  
**Pe**



**Thank you for your  
attention**

TUV NORD GROUP

