

## Completed Innovation and Research Projects

### Projects completed in 2018

| Project           | Description   | Funded by     | Duration                      | DMT contact    |
|-------------------|---|---------------|-------------------------------|----------------|
| <b>BioMore</b>    | New Mining Concept for Extracting Metals from Deep Ore Deposits using Biotechnology | HORIZO N 2020 | 01.02.2015<br>–<br>31.07.2018 | Knut Hirsch    |
| <b>GeoHazCoal</b> | Geohazard Assessment in European and Asian Mining                                   | EUREKA        | 01.05.2017<br>–<br>30.04.2018 | Thomas Imgrund |

### Projects completed in 2017

| Project         | Description  | Funded by         | Duration                      | DMT contact    |
|-----------------|--|-------------------|-------------------------------|----------------|
| <b>Coal2Gas</b> | Enhanced Coal Exploitation through Underground Coal Gasification (UCG) in European Lignite Mines | RFCS              | 01.07.2014<br>–<br>30.06.2017 | Stephan Peters |
| <b>LayTerm</b>  | Layman courses for the Transfer of Expertise on Raw Materials                                    | EIT Raw Materials | 01.01.2016<br>–<br>31.12.2017 | Knut Hirsch    |

### Projects completed in 2016

| Project            | Description  | Funded by | Duration                      | DMT contact                      |
|--------------------|--|-----------|-------------------------------|----------------------------------|
| <b>AMSSTED</b>     | Advancing Mining Support Systems to Enhance the Control of Highly Stressed Ground  | RFCS      | 01.07.2013<br>–<br>30.06.2016 | Torsten Gorka,<br>Stephan Peters |
| <b>ArchHUB I</b>   | Arctic Network Hub Pilot   | EIT       | 01.01.2016<br>–<br>31.12.2016 | Norbert Benecke                  |
| <b>COGAR</b>       | Underground Coal Gasification in Operating Mine and Areas of High Vulnerability  | RFCS      | 01.07.2013<br>–<br>30.06.2016 | Torsten Gorka                    |
| <b>COWEST</b>      | Coal Weathering Study to Predict Oxidation, Improve Coke Properties and Protect Coke Oven Operation  | RFCS      | 01.07.2013<br>–<br>30.06.2016 | Drazen Gajic                     |
| <b>HEATFLOW</b>    | Development of a Numerical Model based on the finite Volume Method for Modelling Thermo-hydraulic Processes in Fault-related Geothermal Reservoirs – Subproject A: Focus on Practicality of the Procedure and Application in the Field, Project Coordination | BMBF      | 01.04.2013<br>–<br>31.03.2016 | Michael Eckart                   |
| <b>MANAGER</b>     | Management of Mine Water Discharges to Mitigate Environmental Risks for Post-Mining Period   | RFCS      | 01.07.2013<br>–<br>30.06.2016 | Christoph Klinger                |
| <b>M SmartGrid</b> | Mining Smart Electrical Grids  | RFCS      | 01.07.2013<br>–<br>30.06.2016 | Rainer Rellecke                  |

### Projects completed in 2015

| Project   | Description  | Funded by | Duration                      | DMT contact  |
|---|--|-----------|-------------------------------|--|
| <b>AVENTO</b>                                     | Advance tools for ventilation and methane emissions control  | RFCS      | 01.07.2012<br>–<br>30.06.2015 | Rainer Rellecke  |
| <b>COMEX</b>                                      | Complex mining exploitation: optimizing mine design and reducing the impact on human environment   | RFCS      | 01.07.2012<br>–<br>30.06.2015 | Stephan Peters   |
| <b>I2Mine</b>                                     | Innovative Technologies and Concepts for the Intelligent Deep Mine of the Future   | FP7       | 01.11.2011<br>–<br>31.10.2015 | Axel Studeny,<br>Rainer Rellecke,<br>Christian Hartmann,<br>Jörg Niese |
| <b>INREQ</b>                                      | Enhanced effectiveness and safety of rescuers involved in high risk activities by designing innovative rescue equipment systems  | RFCS      | 01.07.2012<br>–<br>30.06.2015 | Rainer Rellecke  |
| <b>WTZ<br/>China<br/>Yangtze<br/>e GEO<br/>II</b> | Land Use Change, Soil Erosion, Mass Movements, and Diffuse Matter Inputs at the Yangtze River in the Three-Gorges Region;<br>Focus: Subproject 3 - Quantification of Geogenic Structures and Processes by way of Geophysical and Geodetic Monitoring | BMBF      | 01.06.2012<br>–<br>31.12.2015 | Paul Althaus   |

### Projects completed in 2014

| Project                                     | Description  | Funded by | Duration                      | DMT contact        |
|---|--|-----------|-------------------------------|--------------------|
| <b>CO2RINA</b>                              | CO2RINA – Integrated risk assessment of CO2 storage in deep geological formations  | BMBF      | 01.09.2011<br>–<br>31.08.2014 | Ralph Schlueter    |
| <b>GMES4 Mining</b>                         | GMES4 Mining: GMES-based Geoservices for Mining Areas in Support of Processes in Prospection, Exploration and Monitoring for Environmental Protection and Operational Safety | Land NRW  | 15.08.2011<br>–<br>14.08.2014 | Karsten Zimmermann |
| <b>Unterirdische Pumpspeicherkraftwerke</b> | Development of a Realization Concept for the Utilization of Facilities of Coal Mining as an underground Pumped-Storage Power Plant   | Land NRW  | 15.10.2012<br>–<br>30.04.2014 | Jens-Peter Lux     |

### Projects completed in 2013

| Project             | Description   | Funded by | Duration                      | DMT contact                          |
|---------------------|---|-----------|-------------------------------|--------------------------------------|
| <b>CoGasOut</b>     | Development of novel technologies for predicting and combating gas outbursts and uncontrolled emissions in thick seam coal mining | RFCS      | 01.07.2010<br>–<br>30.06.2013 | Ulrich Brandt                        |
| <b>DENSI-CHARGE</b> | Improving the use of alternative raw materials in coking blends through charge densification                                      | RFCS      | 01.07.2010<br>–<br>30.06.2013 | Drazen Gajic,<br>Friedhelm Strelow   |
| <b>MISSTER</b>      | Mine shafts: improving security and new tools for the evaluation of risks   | RFCS      | 01.07.2010<br>–<br>30.06.2013 | Rainer Kuchenbecker,<br>Martin Weber |
| <b>MINFIREX</b>     | Minimising risk for and reducing impact of fire and explosion hazards in underground coal mining                                  | RFCS      | 01.07.2010<br>–<br>30.06.2013 | Heinrich Petersmann                  |

**Projects completed in 2012**

| Project                           | Description  | Funded by | Duration                      | DMT contact                            |
|-----------------------------------|--|-----------|-------------------------------|--|
| <b>EMIMSAR 11500</b>              | Enhanced miner-information interaction to improve maintenance and safety with augmented reality technologies and new sensors | RFCS      | 01.07.2009<br>–<br>30.06.2012 | Dietmar Plum                           |
| <b>IMPACTMIN</b>                  | Impact Monitoring of Mineral Resources Exploitation  | RFCS      | 01.01.2010<br>–<br>31.12.2012 | Dieter Wittenberg,<br>Gregor Hannsmann |
| <b>UCG CO<sub>2</sub>-Storage</b> | Study of deep underground coal gasification and the permanent storage of CO <sub>2</sub> in the affected areas               | RFCS      | 01.07.2010<br>–<br>31.12.2012 | Ralph Schlüter                         |

### Projects completed in 2011

| Project                  | Description  | Funded by | Duration                      | DMT contact                         |
|--------------------------|--|-----------|-------------------------------|-------------------------------------|
| <b>CLEAN CO2 Altmark</b> | Design and development of an Optimal Seismological Monitoring Network for the Monitoring of Reservoir Overburden and Cap Rock (TV IV, CO2 MONITOR) – Special GEOTECHNOLOGIES Program | BMBF      | 01.07.2008<br>–<br>30.06.2011 | Ralf Fritschen                      |
| <b>COALSWAD</b>          | Investigation of adsorption and swelling behaviour of coal to determine the feasibility of CO2 sequestration and CH4 production enhancement  | RFCS      | 01.07.2008<br>–<br>30.06.2011 | Ralph Schlueter                     |
| <b>EDAFFIC</b>           | Early Detection and Fighting of Fires in belt Conveyors  | RFCS      | 01.07.2008<br>–<br>30.06.2011 | Heinrich Petersmann                 |
| <b>EMTECH</b>            | Fires, Evacuation, Refuge and Rescue Support   | RFCS      | 01.07.2008<br>–<br>30.06.2011 | Rainer Rellecke                     |
| <b>FLOMINET</b>          | Flooding Management for underground coal mines considering regional mining networks  | RFCS      | 01.07.2008<br>–<br>30.06.2011 | Christoph Klinger                   |
| <b>IMPRES</b>            | Improved Extraction Ratios for Deep Coal Mines   | RFCS      | 01.07.2008<br>–<br>30.06.2011 | Hans-Werner Huwe,<br>Jürgen te Kook |

### Projects completed in 2010

| Project          | Description  | Funded by | Duration                      | DMT contact     |
|------------------|--|-----------|-------------------------------|-----------------|
| <b>CO2 SINUS</b> | Evaluation of the Efficiency and Sustainability of CO2 Storage in "in situ" Converted Coal Seams - Special GEOTECHNOLOGIES Program | BMBF      | 01.06.2008<br>–<br>30.11.2010 | Ralph Schlueter |

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