# Table of Contents

J. Geisler, VRB e.V., GER  
**Security of supply, sustainability and resource efficiency** ................................................................. 1

P. Eysel, KfW IPEX-Bank GmbH, GER  
M. Götte, KfW Entwicklungsbank, GER  
**Financing of mining projects – Can banks drive sustainability?** .......................................................... 9

Z. Agioutantis, A. Athousaki & E. Steiakakis, Technical University Crete, GR  
**Effect on best practices by the lack of mineral policy** ........................................................................... 19

G. Tiess, University of Leoben, A  
S. Mujjianto, Ministry of Energy and Mineral Resources, ID  
**Mineral resources policies and governance in Indonesia** ..................................................................... 25

E. Lammer, Sandvik Mining and Construction G.m.b.H., A  
**“SAFETY FIRST” in the development of underground mining machines** ........................................... 41

F. X. Spachtholz, K+S Aktiengesellschaft, GER  
**Sustainability and resource efficiency in potash and rock salt mining** .............................................. 49

H. Hejny, MIRO - Mineral Industry Research organisation, UK  
**IntelliMine – Innovative technologies and concepts for the sustainable and intelligent Deep Mine of the future** .................................................................................................................. 63

J. Craynon & M. Karmis, Virginia Tech, USA  
**Optimizing coal mine design for sustainable development at large surface coal mining operations in Appalachia** ............................................................................................................... 75

M. T. Ansari, Niitco GmbH, GER  
**Infrastructure in mining industries: A geopolitical and investment challenge** .................................... 83

A. M. Esteves, Community Insights, NL  
M. A. Barclay & D. Brereton, University of Queensland, AUS  
D. Samson, University of Melbourne, AUS  
**Enhancing the benefits of projects through local procurement** ........................................................... 95

K. Galos, Polish Academy of Sciences, PL  
**Importance of mineral secondary and waste raw materials in the minerals’ management - Poland’s case** ........................................................................................................................................ 109

D. M. Franks, T. Cohen, R. Barnes, & D. Brereton, University of Queensland, AUS  
A. Littleboy & K. Moffat, Minerals Down Under National Research Flagship, CSIRO, AUS  
**Social license in design: Constructive technology assessment within a minerals research & development institution** .............................................................................................................. 123

F. Haslam McKenzie & A. Hoath, Curtin University, AUS  
V. Paul, Universidade de Santiago de Compostela, E  
**Managing land use conflicts for sustainable futures: Tourism, agriculture and mining** ................... 139
E. A. Adey, R. K. Shail, F. Wall & M. Varul, University of Exeter, UK
P. Whitbread-Abrutat, The Eden Project, UK
C. Baciu, University of Babes-Bolyai, RO
T. Ejdemo, Luleå University of Technology, S
I. Lovric, University of Mostar, BIH
V. Udachin, Institute of Mineralogy, RUS
Corporate social responsibility within the mining industry: case studies from across Europe and Russia

M. Arias, Mafalda Arias and Associates, CAN
Culture, a pillar in your sustainability initiatives

L. Kulik & J. den Drijver, RWE Power AG, GER
Holistic planning and approval of sustainable lignite mining and utilization

D. Gärtner & A. Oster, RWE Power AG, GER
Using the continuous improvement process to optimize opencast mining operations

M. Eyll-Vetter, M. Kosma & M. Henneman, RWE Power AG, GER
Recultivation and regional cooperation for a sustainable development of the post-mine landscape

P. N. Martens, T. Katz, S. Ahmad & M. Fuchsschwanz, RWTH Aachen University, GER
Contribution to sustainable development through alternative dumping concepts for coal mine waste dumps in Vietnam

Y.- R. Pastarus, Tallinn University of Technology, EST
M. Lohk, Eesti Energia Kaevandused Ltd., EST
Waste management in Estonian oil shale industry

J. Bőhm & I. Gombkőtő, University of Miskolc, H
Possibilities of utilizing mineral wastes in Hungary

Study on multi layer covering systems of non acid forming and potentially acid forming of coal mine waste rock to control acid mine drainage

I. T. Oramah & J. P. Richards, University of Alberta, CAN
Can community-based mining support rural sustainable development objectives in Nigeria?

Z. Mullard & D. van Zyl, University of British Columbia, CAN
The risks, challenges and benefits of using social media in the mining industry

S. Addie, University of Victoria, AUS
Zonal land-use planning and the mineral industry: The need for a new approach to finding sustainability underground

M. A. Rodrigues da Silva Enríquez, Universidade Federal do Pará (UFPA) & Universidade da Amazônia (UNAMA), BR
Curse or blessing? The sustainable development dilemma of mining regions in Brazil

Al. Valero, A. Valero & A. Domínguez, CIRCE - Centre of Research for Energy Resources and Consumption, E
Trends of exergy costs and ore grade in global mining
A. Pavlides, D.T. Hristopulos & Z. Agioutantis, Technical University of Crete, GR
C. Roumpos, Public Power Corporation S.A., GR
**Evaluation of multilayer deposit layers using a profitability index**.......................... 317

Al. Valero & A. Valero, CIRCE - Centre of Research for Energy Resources and Consumption, E
**The exergy decrease of the mineral capital endowment due to raw-material production**........... 325

B. Radwanek-Bak, Polish Geological Institute, PL
**Critical minerals to the European Union economy: Poland - A case study**.......................... 335

P. J. M. Groot, M. van Elp & R. Saitua Nistal, Economic Institute for Construction and Housing (EIB), NL
**Long term demand for construction raw materials and the implications for minerals provision; the case of sand and gravel in the Netherlands**.......................... 339

J. Everingham & C. Pattenden, The University of Queensland, AUS
**Sustaining resource communities: A case for collaboration, coexistence and community considerations in mining-affected regions of Australia**.......................... 349

A. Shtiza, Katholieke Universiteit of Leuven, B
**How can the past cease to be a burden for the future sustainable development?**................. 363

D. Laurence & B. Hebblewhite, University of New South Wales, AUS
**Strategies for ensuring a sustainable supply of quality mining professionals for the world**...... 371

L. Bergkvist, Atlas Copco Rock Drills AB, S
**Sustainable mining operations with Atlas Copco’s products**........................................... 379

G. Daws, Graham Daws Associates Ltd, UK
A. Oxley, Minova Weldgrip UK Ltd, UK
N. Woodward, Rockbolting Technology Ltd, UK
**The introduction of UK rock bolting technology into coal mines around the world**.............. 387

H. Bussmann & U. Paschedag, Bucyrus Europe GmbH, GER
**Sustainability at Bucyrus**......................................................................................... 397

M. García-Vásquez & D. van Zyl, The University of British Columbia, CAN
**The role of employee capacity building in reducing company-community conflicts in Peru**..... 407

D. Tuazon, G. Corder, M. Powell & M. Ziemski, The University of Queensland, AUS
**A practical and rigorous approach for the integration of sustainability principles into the decision-making processes at minerals processing operations**.......................... 415

J. Shandro, M. Scoble, M. M. Veiga & M. Koehoorn, University of British Columbia, CAN
A. Ostry, University of Victoria, CAN
**Health research studies in British Columbia mining communities**................................. 429

A. Duerksen & E. Westman, Virginia Tech, USA
**Wind power as an alternative post-mining land use in surface coal mines in West Virginia, U.S.** 445

B. Asi & B. Farshadi, Kavoshgaran Consulting Engineers, IR
M. J. Habibian, National Iranian Copper Industries Co. IR
**Environmental impact assessment framework of taft copper project**.......................... 461
<table>
<thead>
<tr>
<th>Authors</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>D. Rumenjak</td>
<td>Evidence theory in the construction of linguistic variables for minerals industry</td>
<td>473</td>
</tr>
<tr>
<td>B. Salopek &amp; D. Rajkovic</td>
<td>Development of a tool for assessing the environmental sustainability of mining facilities</td>
<td>479</td>
</tr>
<tr>
<td>G. Gaidajis &amp; K. Angelakoglou</td>
<td>Development of a tool for assessing the environmental sustainability of mining facilities</td>
<td>489</td>
</tr>
<tr>
<td>F.-J. Wodopia</td>
<td>General conditions for sustainable coal use in Germany</td>
<td>503</td>
</tr>
<tr>
<td>F. Jerzy Wodopia</td>
<td>Is a road to sustainable use of non-renewable mineral raw materials possible?</td>
<td>517</td>
</tr>
<tr>
<td>S. Belboom, R. Renzoni &amp; A. Léonard</td>
<td>Life cycle assessment as decision tool for sustainable choices in mineral materials field: environmental declarations of Belgian products and their foreign equivalents</td>
<td>535</td>
</tr>
<tr>
<td>H. Tudeshki &amp; A. Tayebi</td>
<td>Development of a new method for quality control in the quarry industry for practicing sustainability</td>
<td>539</td>
</tr>
<tr>
<td>M. Abdi Oskouei &amp; M. Osanloo</td>
<td>The effect of mine reclamation program implementation on sustainability of region</td>
<td>549</td>
</tr>
<tr>
<td>L. Reyes-Bozo &amp; A. Godoy-Faúndez</td>
<td>Sustainable bioremediation and industrial ecology model: A sustainable management alternative for mining industry</td>
<td>559</td>
</tr>
<tr>
<td>Z. Hyder &amp; M. Karmis</td>
<td>Assessing the contribution of underground in-situ coal gasification (UICG) within a sustainable development framework</td>
<td>569</td>
</tr>
<tr>
<td>K. Baris &amp; A. Ozarslan</td>
<td>The role of coal and CCS in energy policy and sustainable development of Turkey: Is it compatible to the EU energy policy?</td>
<td>581</td>
</tr>
<tr>
<td>F. Charlier, P. Blomen &amp; C. Slotta</td>
<td>Uranium as nuclear fuel - scarce or sufficient available resource?</td>
<td>597</td>
</tr>
<tr>
<td>G. Mucsi, B. Csőke, I. Gombkőtő, J. Faitli &amp; B. Kovács</td>
<td>Utilization of lignite fly ash as hydraulic binder and backfill material</td>
<td>611</td>
</tr>
<tr>
<td>S. Kahraman, M.S. Delibalta &amp; R. Comakli</td>
<td>The assessment of noise from block cutting machines using the P-wave velocity</td>
<td>627</td>
</tr>
<tr>
<td>Page</td>
<td>Title</td>
<td>Authors/Institutions</td>
</tr>
<tr>
<td>------</td>
<td>------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>633</td>
<td>Contribution of engineering methods to sustainable development of mining systems</td>
<td>T. Winkler, W. Chuchnowski, M. Dudek, D. Michalak &amp; J. Tokarczyk, KOMAG Institute of Mining Technology, PL</td>
</tr>
<tr>
<td>645</td>
<td>Effect of mine water on the stability of underground coal mine roadways</td>
<td>H. Takamoto, T. Sasaoka, H. Shimada &amp; K. Matsui, Kyushu University, J M. Ichinose, CUIRE, J</td>
</tr>
<tr>
<td>667</td>
<td>Responsible coal sourcing – taking the next step</td>
<td>A. K. Bayer, E.ON New Build &amp; Technology GmbH, GER R. Strandahl, E.ON Energy Trading SE, GER</td>
</tr>
<tr>
<td>675</td>
<td>Developing a practical mechanism for incorporating sustainability principles into mineral processing plant design and operation</td>
<td>G. D. Corder, University of Queensland, AUS S. R. Green, SUSOP Pty Ltd, AUS</td>
</tr>
<tr>
<td>689</td>
<td>A new proposal for reutilization of bauxite red mud: Exploring its use in isolation technologies for hazardous substances</td>
<td>D. Rubinos, RWTH Aachen University, GER and University of Santiago de Compostela, E F. Díaz-Fierros &amp; M. T. Barral, University of Santiago de Compostela, E</td>
</tr>
<tr>
<td>703</td>
<td>The CTC (Certified Trading Chains) Mineral Certification System: A contribution to supply chain due diligence and good governance in the mining sector of Rwanda and the great lakes region in Central Africa</td>
<td>P. Schütte, G. Franken, J. Vasters, F. Melcher &amp; D. Küster, Federal Institute for Geosciences and Natural Resources (BGR), GER</td>
</tr>
<tr>
<td>717</td>
<td>Mine tailings used as alternative material for asphalt pavement</td>
<td>Z. Song, M. Rinne &amp; L. Korkiala-Tanttu, Aalto University, FIN</td>
</tr>
<tr>
<td>727</td>
<td>Does sustainable mining have any meaning?</td>
<td>D. J. Williams, The University of Queensland, AUS</td>
</tr>
<tr>
<td>737</td>
<td>Critical raw materials and the EU</td>
<td>L. Tercero Espinoza, C. Gandenberger &amp; F. Marscheider-Weidemann, Fraunhofer Institute for Systems and Innovation Research ISI, GER</td>
</tr>
<tr>
<td>747</td>
<td>Bundling of German expertise in sustainable raw material economy</td>
<td>H. D. Brenk, Chairman of the German Federation of International Mining and Mineral Resources &amp; President of BS-Consultants GmbH, BER</td>
</tr>
</tbody>
</table>
J. Kretschmann, Technische Fachhochschule Georg Agricola zu Bochum, GER  
N. Nguyen, RWTH Aachen University, GER  
Social sustainable development in Vietnamese coal mining industry – challenges in occupational safety and health................................................................. 779

R. C. Karra, National Institute of Technology Karnataka, IN  
Influence of work culture on job satisfaction of mining engineers: A case study.............. 789

G. Balletto & C. Furcas, University of Cagliari, I  
Overcoming local conflicts and production needs related to mining. Social impact assessment and local participation......................................................... 797

B. Farshadi & B. Asi, Kavoshgaran Consulting Engineers, IR  
M. J. Habibian, National Iranian Copper Industries Co, IR  
Producing a GIS based multi attribute decision making for social and environmental sustainability assessment in a copper mine in Iran...................................................... 813

S. Šolar, Geological Survey of Slovenia, SLO  
D. Shields, Colorado State University and Politecnico di Torino, USA  
The SARMa Project: enhancing sustainable aggregates resource management and supply in Southeast Europe............................................................. 827

D. Wittmer, A. Usubiaga & P. Schepelmann, Wuppertal Institute, GER  
W. E. Falck, Université de Versailles, F  
S. Šolar, Geological Survey of Slovenia, SLO  
F. Blanchard, Bureau des Recherches Géologiques et Minières, F  
J. Spangenberg, Sustainable Europe Research Institute, GER  
Satisfying information requirements on mineral extraction by applying Earth Observation methods: First results from EO-MINERS........................................................................ 837