Contents

1 Introduction .............................................. 1
Kwame Awuah-Offei

Part I Ground Fragmentation

2 Energy Distribution in the Blast Fragmentation Process .......... 11
Braden Lusk and Jhon J. Silva

3 Effect of Hole Stemming Practices on Energy Efficiency of Comminution ............................................. 31
Calvin J. Konya and Anthony Konya

4 Effect of Wave Collision on Fragmentation, Throw, and Energy Efficiency of Mining and Comminution ............... 55
Catherine Johnson

5 Energy Efficiency of Drilling Operations .......................... 71
Celal Karpuz

6 Energy Efficiency in Rock Blasting ................................. 87
José A. Sanchidrián, Pablo Segarra and Lina M. López

Part II Material Handling

7 Energy-Efficient Loading and Hauling Operations ................. 121
Ali Soofastaei, Elnaz Karimpour, Peter Knights and Mehmet Kizil

8 Energy Efficiency in Cable Shovel Operations .................... 147
Kwame Awuah-Offei

9 Benchmarking Energy Consumption of Truck Haulage .......... 159
Lalit Kumar Sahoo, Santanu Bandyopadhyay and Rangan Banerjee

10 Role of the Operator in Dragline Energy Efficiency ........... 181
Maryam Abdi-Oskouei and Kwame Awuah-Offei
Part III  Mineral Processing and Extractive Metallurgy

11 Energy-Efficient Comminution: Best Practices and Future Research Needs ........................................ 197
   Bern Klein, Chengtie Wang and Stefan Nadolski

12 Energy Efficiency of Electrowinning ........................................ 213
   Michael S. Moats

13 Plant Automation for Energy-Efficient Mineral Processing ........ 233
   Jocelyn Bouchard, Daniel Sbarbaro and André Desbiens

14 Energy Management Systems in Copper Smelting: The Atlantic Copper Case Study ..................................... 251
   José Maria Tejera, Guillermo Rios, Tasio Martínez and Miguel Palacios

Part IV  Renewable Energy and Miscellaneous Topics

15 Solar Energy Applications in Mining: A Case Study ............ 273
   José Pablo Paredes Sánchez

16 Energy-Efficient Mine Ventilation Practices ............................. 287
   Nuray Demirel

17 Technology Selection and Sizing of On-Board Energy Recovery Systems to Reduce Fuel Consumption of Diesel-Electric Mine Haul Trucks ........................................ 301
   Petrus J. Terblanche, Michael P. Kearney, Clay S. Hearn and Peter F. Knights
Energy Efficiency in the Minerals Industry
Best Practices and Research Directions
Awuah-Offei, K. (Ed.)
2018, VI, 333 p. 95 illus., 61 illus. in color., Hardcover
ISBN: 978-3-319-54198-3