

# Energy portfolio versus sustainability of mining industry

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## ABSTRACT

Global economic and population growth have resulted in an increasing overall demand for metals and other minerals in long-term. To meet up this growing demand, extraction of mineral deposits associated with conditions beyond norm is becoming more and more necessary. But, this quest is constantly being challenged by the depth and the location (remote and/or underwater) of such resources. Additionally, strict environmental regulations are also raising the bar for mines by introducing restrictive obligations on carbon emissions and other pollutions. Facing such critical circumstances, and being an energy intensive industry, mining feels the urge to move towards more sustainable use of energy. This paper offers a holistic view of the status quo of energy portfolio of mining sector. Also, it discusses various solutions that can be implemented to improve the sustainability of this industry through increasing energy efficiency, integration of renewables into conventional mine energy systems and development of novel mine energy technologies. It categorizes three different mine energy roadmaps based on the utilization of conventional, contemporary and futuristic technologies. To establish decision making guidelines, an evaluation matrix is established based on a criterion set including occupational health and safety, cost, climate change, reliability and training of highly qualified professionals. A comparative study has been conducted to underline the pace and the momentum required for transitioning from conventional towards contemporary approaches. Furthermore, a vision of more probable futuristic approaches has been canvassed. In a line, this study is a mapping tool that holds a forecast of the sustainability in mine energy management.