

From the Editor

In this current issue, five papers are published focusing on 1) Characteristics of ultramafic rocks as carbon storage, 2) Post-mining guarantees estimation, 3) Fuel consumption calculation in mining industry, 4) Critical mineral exploration, and 5) Coal upgrading using heavy oil.

Ultramafic rocks have wide distribution in southeastern arm of Sulawesi Island, especially in Sorowako and the surrounding areas. This research used an observation method on outcrops and supported by laboratory analysis. The magnesium (Mg) element contained in the research area is widely spread as well as the development of geological structure allows the potential development of ultramafic rocks as carbon storage. The storage of carbon dioxide in ultramafic rocks is considered as one of the safest storage method because carbon dioxide reacts naturally with magnesium-rich minerals contained in these rocks. The reaction between carbon dioxide and magnesium-rich minerals such as olivine, pyroxene, and serpentine will produce magnesite (MgCO_3), which is more stable in nature.

A post-mining guarantee is a financial commitment made by a mining company to restore the land after mining operations are complete. The goal of a post-mining guarantee is to improve environmental responsibility in the mining industry. This paper describes about case study at PT. X, who wants to obtain a Production Operation IUP that requires reclamation guarantee funds and post-mining guarantees. Based on this, this research aims to estimate the amount of reclamation and post-mining guarantees that will be deposited to the government. The cost plan for reclamation and post-mining was calculated according to the Ministerial Decree of Energy and Mineral Resources No. 1827 K/30/MEM/2018, which involve direct and indirect cost.

Vehicle fuel consumption is a significant factor in the modeling and estimation of vehicle operating cost and traffic congestion costs. Fuel consumption in mining industry is usually influenced by several factors, the most influential of which are the slope of the road, the type of material used for the road, and the distance from the loading place to the dumping place. There are several methods used to calculate fuel consumption, the most familiar of which is the vehicle working hours (hourmeter) method. In this research, the calculation of fuel consumption uses engine RPM with a segment approach method taken with a segment distance of between 100 - 200 meters. The conclusion from this research is calculating fuel consumption using the engine RPM method using a segment approach produces results that are close to the actual value. However, engine RPM calculations are still based on subjectivity, not objectivity/measurement.

Critical minerals have emerged as an important component in the global transition to clean energy technologies. Countries around the world are increasingly recognizing the importance of securing reliable supplies of critical minerals to support their industrial and technological ambitions. This research aims to provide an overview of the current state of critical minerals, the potential of critical minerals that exist globally such as Europe, Africa, the Middle East, and Asia and the challenges for exploration in the Indonesian region. This paper also presents several things that need to be considered in exploiting critical minerals, including environmental management. The environmental impact of mining activities is a significant concern. Sustainable practices must be prioritized to mitigate ecological damage and ensure compliance with both local and international environmental standards.

Coal is one of the most important fuel resources in national development. Most of the coal in Indonesia is lignite type. Lignite has a high moisture content (30-50%) and relatively low calorific value compared to other types of coal. This causes low combustion efficiency, making it not optimal for use as fuel. In this study, the slurry dewatering process was applied to the lignite to increase its calorific value and decrease the moisture content using the addition of heavy oil produced from catalytic cracking of Polypropylene-Low Density Polyethylene (PP/LDPE) plastic waste pyrolysis oil. This heavy oil is used as an additive for lignite because it has some chemical properties in common for coal, with some similarities this property makes this residual oil able to enter coal pores. This process succeed to increase the calorific value from 3,662 cal/g to 6,374 cal/g and decrease the moisture content from 37.29% to 2.81%.

Enjoy read.