

Coal Mining in Sarawak: An Overview



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For Malaysia, in particular Sarawak, the diversity of available energy resources is a huge advantage. In addition to renewable energy resources such as hydropower, biomass and solar-generated power, Sarawak also has a large potential reserve of non-renewable fossil fuel such as oil, gas and coal.

Coal is actively mined in several areas in the state, including Silantek, Mukah and Meit-Pila in central Sarawak. These are among the largest coal deposits in the state and in the country. Coal plays a vital role in the generation of electricity in Malaysia, especially in Sarawak. Coal-fired power plants currently produce approximately 10% of the state's electricity and the figure is steadily growing.

There are many reasons for the increasing use of fossil fuel, including strategic, economic and availability factors. Use of coal as an energy source, together with its useful heating properties in the manufacture of cement and bricks as well as in power generation, is now commonplace in Sarawak. Furthermore, with the relatively high price of oil in the global market, electricity corporations find that coal is a more economical option.

HISTORY OF COAL MINING IN SARAWAK

The Silantek coalfield had been in operations as early as 1920s. Previous investigations of the coalfield were carried out by the following companies:

- Evans J.W. (1925-1926).
- Osborne and Chappel (1928-1931).
- N.S. Halle (1954) and the Nippon Coal Mining Sdn. Bhd. (1961-1962).
- Joint investigation between Nippon Coal Mining and Ataka Company (1969-1970).
- Sarawak Coal Prospecting Corporation (1981-1982) was granted a GPL in 1981 to prospect the Silantek and Sg. Merah region.

After the Sarawak Coal Prospecting Corporation, Luckyhill Mining Sdn. Bhd. applied for and was granted a prospecting licence for the Silantek coalfield. Prospecting work started in April 1983 and ended in November 1983.

Currently, the coalfield produces a good quality coking coal with a relatively high net calorific value. Due to its excessively thick overburden ranging up to 55 metres, a longwall mining method is being carried out in the underground mine in the Silantek area.

An exploration company has been prospecting for coal in the Meit-Pila coalfield in Sarawak from 1974 to 1978. Detail surveying, mapping and diamond drilling were carried out to further delineate the coal reserves by establishing the number and thickness of coal seams present, the

geological structure of the area and the quality of the coal. The area was proven at the time to have coal reserves of 4.4-5.2 million tonnes of sub-bituminous coal which could likely be recovered using the opencast mining method.

As for the Mukah-Balingian coalfield, the area was first explored in 1974 by Sarawak Shell Berhad and Amax International, followed by a few more local companies. Currently, 6 mineral tenement holders (Mining Lease holders) occupy several areas in Mukah and Balingian where the quality of lignite is slightly low and of an inhydrous nature. A straightforward approach of opencast mining is being carried out here with lots of excavation work and machines used in the mining pit and along the benches.

MAIN TYPES OF MINING METHODS

1. Opencast mining

- Use of excavators, haulage lorry.
- Proposed to use explosive.
- To form several pit benches for ground stability.
- Simple documentation of Operational Mining Scheme.

2. Underground mining

- Using longwall method.
- Sometime explosives are used when approaching granitic host rock.
- Complex preparation of Operational Mining Scheme.
- Ventilation system and roof supports.

The main objective in any commercial mining operation is the exploitation of the mineral deposit at the lowest possible cost with a view of maximising profits. The selection of physical design parameters and the scheduling of the ore and waste extraction programme are complex engineering decisions of enormous economic significance.

The planning of an open pit mine is, therefore, basically an exercise in economics, constrained by certain mining engineering and geologic aspects. In an open pit coal mine, the pit bottom would be the bottom mined coal seam elevation, since it is usually feasible to extract multiple seams when using surface mining method to extract coal.

Sometimes coal seams run too deep underground for opencast mining and so require underground mining. The complexity of mining engineering factors such as ventilation

system, selection of material for roof supports, underground surveying etc., proves that it can be quite challenging to implement. A thorough analysis of an expert consultant's technical review, is needed.

PRODUCTION STATISTICS

From 2000 to 2016, 27 million tons of coal were produced in Sarawak and the figure is expected to go up with the increase in the number of prospecting licences for coal in recent years and due to high energy demand with the introduction of the Sarawak Corridor of Renewable Energy (SCORE) project.

ROLES & COMMITMENT

Mining in Malaysia is under the supervision of the Department of Mineral & Geosciences (DMG) Malaysia, as stipulated in the Mineral Development Act 1994 (Chapter 525) and its Regulations. The main role of DMG is to ensure that the tenement holders execute mining operations in a workman-like manner, efficiently and applying engineering best practices as well as maintain productive and sustainable operations. The mining companies are also required to plan and implement the rehabilitation programme during/and post-mining phases.



An open pit coal mine in progress in Mukah



Compliance inspection of an underground coal mine in Silantek



In Kapit, a barge is filled with coal via a conveyor belt

Apart from that, the self-regulated Act actually gives the mineral tenement holders a certain degree of freedom in terms of setting up both mining and technical conditions, based on their own operational considerations, with supervision and approval from the Department. Operational and mining engineering aspects pertaining to safety, health and environmental compliance will always be the Department's main commitment for advancement and a sustainable mining industry, in tandem with the National Mineral Policy 2.

CONCLUSION

With the depletion of non-renewable oil and gas resources, the availability of coal in Sarawak is of great strategic value to Malaysia. However with deeper deposits, there is a need to apply high technology mining methods to ensure a safe mining operation.

Therefore, mining companies need to hire and train very highly qualified people, particularly in underground mining. Methane emission is also a problem when it comes to underground coal mining and DMG and the operators will need to address this at source. Safety is a necessity to attract more locals to the industry.

Sarawak has a good future in coal mining. Coal will allow Malaysia to diversify her energy resources and reduce her dependence on oil and gas. ■

Authors' Bio data

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IEM DIARY OF EVENTS

Title: 27th Annual Professor Chin Fung Kee Memorial Lecture : Underground MRT in Kuala Lumpur - The Inevitable Urban Transit Solution

18 Nov 2017

Organised by: The Institution of Engineers, Malaysia and Engineering Graduates Alumni Association Universiti Malaya (2017)

Time : 9.00 a.m. - 1.00 p.m.

CPD/PDP : 2

Title: ICTSIG Digital Class (November 2017) - Introduction to Web Page Design WITH HTML, JAVASCRIPT and CSS (PART 3) - Postponed from 11 November 2017

18 Nov 2017

Organised by: Information and Communications Technology Special Interest Group

Time : 11.05 a.m. - 1.00 p.m.

CPD/PDP : 2

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