The State of the Mining Industry in Malaysia

by ***Suvarna Ooi***

THE mineral industry is no longer the main contributor to the Malaysian economy unlike 30 years ago when the country was the largest producer and exporter of tin in the world. Even though there is still demand for mineral and products from the mining industry, mining does not seem to be in a good stead in the public eye at the moment. Can the industry rise above the challenge to become a powerful catalyst for Malaysia to achieve the status of an industrialised country by 2020?

Dato' Zulkifly bin Abu Bakar, Director of the Mineral Research Centre (MRC), Mineral and Geoscience Department Malaysia, Ministry of Natural Resources and Environment Malaysia, shares his thoughts on this issue. The MRC, located in Ipoh, Perak, was formerly known as the Mines Research Institute (MRI), the R&D arm of the former Mines Department. The former was formed following the merger of the Mines Department and the Geological Survey Department into the Mineral and Geoscience Department (MGD) in 2000.

Dato' Zulkifly said, "The MRC's new direction focuses on downstream R&D on minerals commonly found in the country. Its previous role pertaining to upstream mine development and midstream oriented service to the mining industry is still being carried out although at a lesser degree." He added that the downstream R&D activities are carried out with two main aims.

The first aim is to enhance and develop techniques to value-add to local mineral resources to produce industrial materials. Identifying the optimal usage for such mineral resources will eventually lead to commercialisation by the various related industries. The second aim is to improve upon and develop techniques to process and beneficiate metallurgically problematical local mineral resources to enhance their suitability for optimum utilisation in local manufacturing industries.

LATEST RESEARCH BY THE MRC

The MRC has the experience and expertise in the characterisation, beneficiation and processing of both metallic and industrial minerals which would be useful to the industry. The centre is equipped with a physico-chemical laboratory for wet chemical analysis and analytical instruments such as X-ray Fluorescence, X-Ray Diffraction, Scanning Electron Microscope, Induced Coupled Plasma (ICP), Atomic Absorption Spectrometer (AAS), Ultra-Violet Spectrometer and Fourier Transform Infra Red (FTIR).

According to Dato' Zulkifly, the MRC's R&D activities are currently centred on industrial minerals such as silica, clay, rocks and advanced materials through detailed characterisation, beneficiation, value adding and new uses. He said, "Malaysia has more than 450 million tonnes of reported kaolin and clay reserves. The local bricks, roof tiles, pots and tiles industry are mainly relying on local clay for their products."

However, to produce higher valued ceramic products such as sanitary wares and table wares, he explained that the clay has to be blended with other materials to produce clay bodies with suitable and consistent properties. To this end, the MRC is carrying out research on the various clay reserves in the country and formulating composite bodies for higher valued products.

So far, the centre has successfully produced formulations for porcelains, semi porcelains, stone wares and earthen wares from local clays and is in the process of commercialisation some of the composite clay bodies. Efforts are focused on producing products with equivalent or better quality with minimal or no addition of imported raw clay materials.

Dato' Haji Zulkifly bin Abu Bakar

Dato' Zulkifly pointed out that the MRC also has the expertise and facilities to study and upgrade silica sand, which can be made into glass and glass products, into the different grades for industrial applications. He stated that the MRC has gone into formulation of crystal glass bodies, production of glass pellets and the actual production of crystal glass using local silica sand. Unlike imported crystal glass which usually contains high lead content, the crystal glass developed by the centre is lead free.

Besides being equipped with laboratory-sized glass melting furnaces and instruments for testing some of the properties of glass produced, the MRC has also successfully produced at laboratory scale advanced materials such as ceramic glass and synthetic wollastonite, a bioactive material which can be further used in making artificial teeth and bones, from local raw minerals.

More recently, the centre has developed a software called Quarry Dust Deposition Model (QDDM) for studying dust deposition rate in local quarries. The MRC also has R&D projects on Ion Exchange Medium based on minerals for

the removal of heavy metal in industrial effluents. Although Precipitated Calcium Carbonate (PCC) making plants using technology requiring premium grade limestone (90% and above $CaCO_3$) are already in existence in the country, the centre has embarked on a different technique capable of using limestone of lesser $CaCO_3$ content of about 80% $CaCO_3$.

Besides that, Dato' Zulkifly said, "The centre is also actively carrying out research on metallurgy and mineral ores separation/processing as well as on control of environmental impacts of mining and quarrying operations, safe and efficient mining/quarrying and rehabilitation of ex-mining and quarrying lands." The MRC has developed a system (Sistem Penanaman Atas Kolam or SPAK) for planting vegetables and herbs on the surface of old mining ponds. The system could also be extended into floating flower gardens for beautification or systems for phyto-remediation of contaminated waters.

MRC is also actively carrying out research on methods of greening of unused or abandoned quarry faces. Greening of quarries and quarry faces are also carried out in existing quarries as part of progressive rehabilitation and sustainable quarrying. Besides planting on quarry faces, selected species are also planted to test its effectiveness for screening dust and noise and to reduce visual impacts of quarrying.

According to Dato' Zulkifly, the MRC has shown some outstanding achievements. He said, "Some of the research findings can be transferred to the private sector and commercialised and used in industries to produce products that have economic value and will increase earnings from the mining industry. Commercialisation of at least two R&D findings is already on the way."

The MRC has also been providing industrial trainings for mining/mineral resources engineering students from the various local institutions of higher learning who are expected to join the industry upon graduation. From time to time, the MGD has been conducting workshops and seminars, some jointly organised with the various states mining and quarrying associations. For example, the Department has been holding courses on drilling and explosives shot-firing jointly organised with the Institute of Quarrying Malaysia, followed by competency assessment and certification on many occasions.

OUTLOOK OF THE MINERAL INDUSTRY

Malaysia is endowed with over 30 different mineral types, comprising metallic, non-metallic and energy minerals, worth billions of ringgit in economic potential. As such, Dato' Zulkifly believes the Malaysian non-petroleum mineral industry will remain as a significant contributor towards the economic, social and industrial development of the country.

He stated that the value of minerals produced in Malaysia in 2008 was RM3 billion, while export of minerals in the same year totalled RM660 million. However, the import of minerals into the country has been quite significant with the total import value worth RM8.39 billion in the same year. Among the minerals imported were coal for power plants, iron ores for iron and steel making, and phosphates for fertilisers.

According to industry reports, the global economy is expected to recover this year thus leading to a stronger demand for metals and minerals. Dato' Zulkifly pointed out that the domestic overall mineral production in the country is expected to show a modest growth in 2010/2011 and improve further in line with improving prices and global demand, in particular, stronger growth in some developing countries which consume a significant amount of Malaysia's minerals production.

He added that the second National Mineral Policy (NMP2), which was launched in January 2009, is expected to provide added incentives for local mining and mineral-based activities. The policy, which also sets out for more revenues and benefits to the states, as owners of lands, is expected to encourage them to release more lands for mineral development.

The NMP2 is an attempt to incorporate the concept of Sustainable Development into a comprehensive policy document for the mineral industry. It aims, among others, to provide the government and the industry with the strategic direction and forward-looking decision-making tools to help ensure that the minerals industry will be revitalised and sustainable. Such measures will go a long way in ensuring that the industry becomes a catalyst for Malaysia to achieve the status of an industrialised country in 2020.

Dato' Zulkifly explained that, in the past, mining and mineral processing activities have resulted in a significant amount of environmental degradation. The primary problems stem from poor mining practices and the uncontrolled discharged of tailings. Coupled with the environmental problems, and closely related with them, is a comparable amount of problems associated with health and safety.

However, he said, "Greater responsibility is now expected from both the government and the industry. The government, through its agencies such as the Ministry of Natural Resources and Environment (NRE), MGD and the Department of Environment (DOE), has the responsibility of establishing and maintaining the enabling environment for the sustainable development of the mining industry."

He added that there is the potential to resolve most of the major problems by the simple application of "best practice" principles for environment, health and safety. Under existing legislations, mining companies are expected to work with stakeholders to improve the quality of life within the communities they operate. A mining projects is to be assessed of its viability and potential environmental impacts through mine feasibility studies, environmental impact assessment and rehabilitation plan before it is allowed to take off.

Going forward, Dato' Zulkifly believes that the MRC's contribution towards the growth of the mining industry will continue to be relevant. He said, "R&D in the mineral sector is important but it is an expensive and risky activity with uncertain outcomes. In view of this, the industry will not be in the position to undertake R&D on its own. As such, the MRC welcomes a strong partnership with the industry, other government research institutions and the university to promote and support R&D." ■