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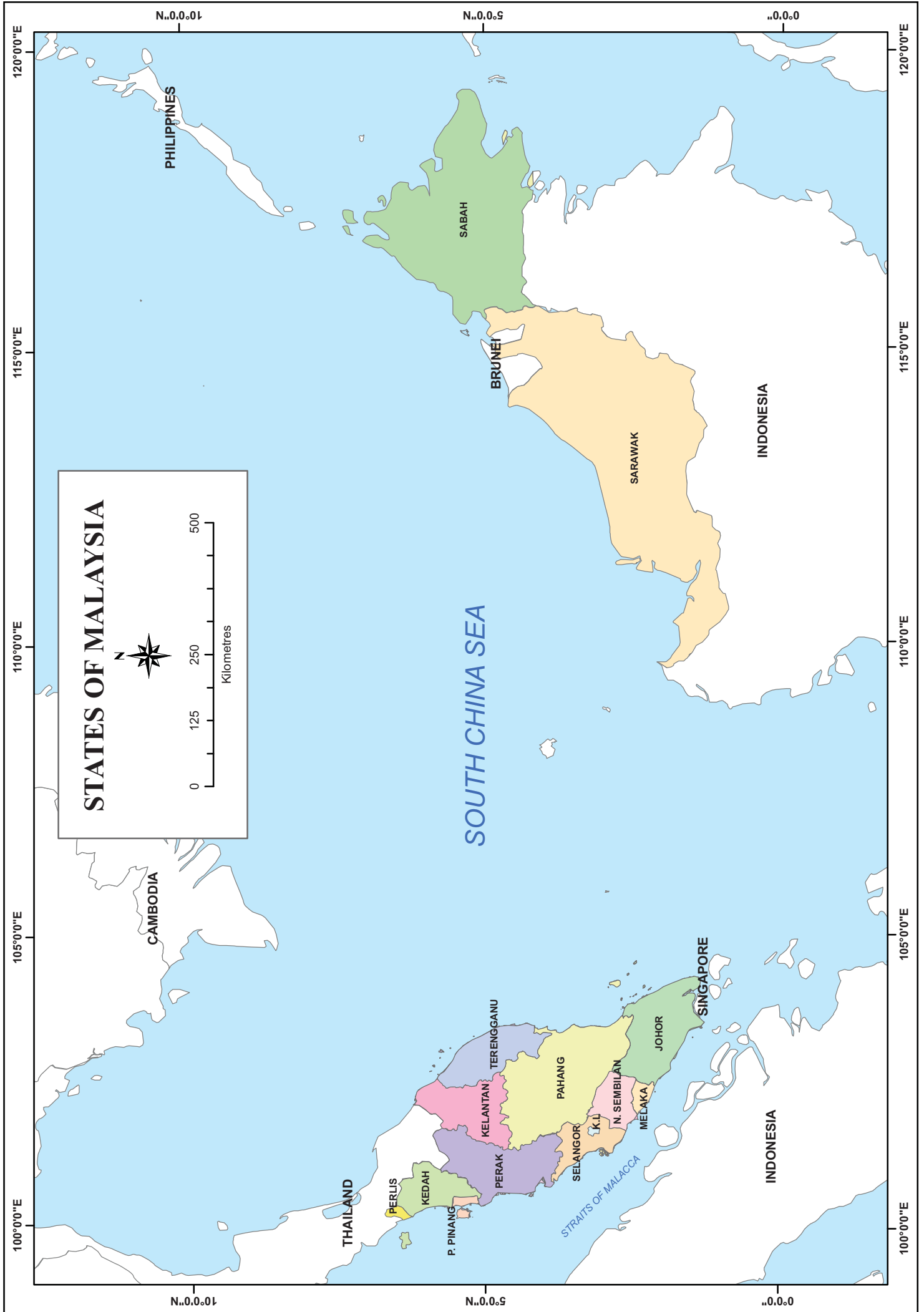
# **MALAYSIAN MINERALS YEARBOOK 2014**

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**MINERALS AND GEOSCIENCE DEPARTMENT MALAYSIA**  
MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT MALAYSIA

24<sup>th</sup> Issue

Price: RM70.00



## PREFACE

This Malaysian Minerals Yearbook 2014 is the 24<sup>th</sup> edition of its series produced by the Minerals and Geosciences Department of Malaysia (JMG). It is a reflection of the added responsibility of being the main reference point for minerals data in Malaysia. Its aim is to provide reliable and comprehensive information on the entire minerals production in Malaysia.

As in the previous year, this report discusses the performance of the Malaysian minerals industry during the year 2014 and provides the background information to assist in interpreting the performance of the mineral sector and mineral commodity produced in Malaysia. Besides, it also provides an overview of some imported minerals that are equally important in domestic mineral industry. The information in this publication includes commodity reviews, mineral production, import, export, mineral prices and analyses of the mineral commodities sector encompassing the metallic, non-metallic and energy minerals. A list of all the mines currently in operation during the year for each state in Malaysia is also presented.

In order to improve the accuracy and reliability of the data, JMG has undertaken various efforts towards strengthening relationships with data providers to improve the quality of its publications for the benefit of the mineral fraternity. JMG welcomes any constructive comments and suggestions that may help us to improve the value of this publication and meet the changing needs and requirements of the mineral sector in Malaysia.

Finally, I would like to extend my sincere appreciation to all the government agencies, various organisations, companies and individuals who have been continuously providing us with the valuable information for the preparation of this report.



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November 2015

## ACKNOWLEDGEMENTS

Although the compilation of this report is principally the effort of the Minerals and Geoscience Department Malaysia, much of the information presented is based on data originally collected by other departments and agencies. The following sources are gratefully acknowledged:

### Trade Statistics:

- *External Trade Statistics 2014* published by the *Department of Statistics, Malaysia*

### World Minerals Production:

- *Mineral Commodity Summaries 2015* published by the *U.S Geological Survey (USGS)*
- *World Mineral Production 2009 - 2013* published by the *British Geological Survey (BGS)*

### Minerals prices:

- *Monthly Commodity Price Bulletin* published by *United Nations Conference on Trade and Development (UNCTAD) - 2014*
- *UNCTAD Commodity Yearbook* published by *United Nations, Geneva - 2014*
- *Industrial Minerals* published by *Metal Bulletin Journals - 2014*
- *Malaysian Tin Bulletin* by *Tin Industry Board - 2014*

## EXPLANATORY NOTES

### Malaysian mineral production data

|                         |   |
|-------------------------|---|
| <b>Aggregates</b>       | Production figures represent the total tonnage of crushed rocks, including crushed limestone for industrial and agricultural uses.              |
| <b>Clays</b>            | Production figures shown also include ball clay.  |
| <b>Copper</b>           | Mine production of copper is shown as copper-in-concentrates.   |
| <b>Conc.</b>            | Concentrates.   |
| <b>Limestone</b>        | Production figures shown include crushed limestone used for aggregates unless specified e.g. limestone for cement.                              |
| <b>Rare earths</b>      | The annual production figures represent the aggregate tonnages of monazite and xenotime concentrates produced as by-products of tin mining.     |
| <b>Silica</b>           | Silica production figures represent the aggregate tonnage of silica sand, mine tailing sand and quartz rock powder.                             |
| <b>Tantalum-Niobium</b> | The annual production figures represent the aggregate tonnage of columbite and struverite concentrates produced as by-products of tin mining.   |
| <b>Tin</b>              | Mine production of tin is shown as tin content of concentrates (tin-in-concentrates).   |
| <b>Titanium</b>         | Production is shown as gross tonnage of ilmenite concentrates produced as a by-product of tin mining. A small amount of rutile may be included. |
| <b>Zirconium</b>        | Production is shown as gross tonnage of zircon concentrates produced as a by-product of tin mining.   |

## Trade

In this edition, three consecutive years of import/export data are shown (2012, 2013 & 2014). Export figures shown in the trade tables represent net exports (i.e. excluding re-exports).

## World production

The world production tables only give the major world producers. Other producers are included in the row depicted as 'other countries'.

## Price graphs

Where information is available, actual prices of mineral commodities are shown over a ten-year period.

## Local terminology

In the review texts, heavy minerals produced in the process of alluvial tin ore beneficiation are referred to by the term 'amang' which is widely used in the local tin industry.

## Units of weight

|       |   |                |   |             |
|-------|---|----------------|---|-------------|
| t     | = | tonne          | = | 1,000 kg    |
| Mt    | = | million tonnes | = | 1,000,000 t |
| kg    | = | kilogram       | = | 1,000 gm    |
| gm    | = | gram           | = | 0.001 kg    |
| tr oz | = | troy ounce     | = | 31.1035 gm  |

## Units of area

|       |   |                  |   |                       |
|-------|---|------------------|---|-----------------------|
| sq km | = | square kilometre | = | 100 ha                |
| ha    | = | hectare          | = | 0.01 square kilometre |

## Units of currency

|     |   |  |
|-----|---|--|
| RM  | = | Ringgit Malaysia   |
| USD | = | US Dollar<br>(2014 average exchange rate: 1US\$ = RM3.27)        |
| £   | = | British Pound<br>(2014 average exchange rate: £1 = RM5.39)       |
| A\$ | = | Australian Dollar<br>(2014 average exchange rate: 1A\$ = RM2.95) |
| €   | = | The Euro<br>(2014 average exchange rate: 1€ = RM4.35)            |

## Conventions

|        |   |   |
|--------|---|---|
| '000   | = | × thousand                                    |
| 0      | = | nil or quantity less than half the unit shown |
| N.A    | = | not available                                 |
| n.y.a. | = | not yet available                             |
| e      | = | estimated                                     |
| p      | = | preliminary                                   |

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## **MALAYSIAN MINERALS YEARBOOK 2014**

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## CONTENTS

|  |          |
|--|----------|
| Preface  | i        |
| Acknowledgements   | ii       |
| Explanatory notes  | iii      |
| <b>OVERVIEW</b>  | <b>1</b> |
| <b>MINERALS IN BRIEF</b>                                     |          |
| Malaysia's minerals production 2013 - 2014                   | 6        |
| Malaysia's production value of minerals 2010 - 2014          | 6        |
| Statistic of selected mineral-based manufacturing industries | 7        |
| Export and import value of major minerals                    | 8        |
| Export value of major mineral-based products                 | 9        |
| Import value of major mineral-based products                 | 10       |
| Summary of Malaysian production of mineral commodities 2014  | 11       |
| <b>COMMODITY REVIEWS</b>                                     |          |
| <b>Metallic Minerals</b>                                     |          |
| Aluminium  | 14       |
| Copper   | 19       |
| Gold   | 24       |
| Iron   | 29       |
| Manganese  | 34       |
| Rare earth minerals  | 38       |
| Silver   | 42       |
| Tantalum/Niobium minerals                                    | 46       |
| Tin  | 49       |
| Titanium   | 54       |
| Zircon   | 58       |
| <b>Non-Metallic Minerals</b>                                 |          |
| Aggregates   | 63       |
| Barytes  | 66       |
| Bentonite/Fuller's Earth                                     | 70       |
| Clays  | 74       |
| Feldspar   | 77       |
| Gypsum and Anhydrite   | 81       |
| Kaolin   | 84       |
| Limestone  | 88       |
| Mica   | 91       |
| Phosphate rock   | 94       |
| Sand and Gravel  | 96       |
| Silica   | 99       |
| <b>Energy Minerals</b>                                       |          |
| Coal   | 103      |
| <b>MINES IN 2014</b>   |          |
| List of operating mines in Malaysia 2014                     | 110      |



# OVERVIEW

## Introduction

The global economy expanded at a moderate pace in 2014, with uneven growth across and within regions. The Malaysian economy recorded a stronger growth of 6.0% in 2014 compared with 4.7% in 2013. Particularly, net exports recorded a positive growth in 2014 after seven consecutive years of negative contributions. Growth was driven by the continued strength in private domestic demand, and supported by the improvement in external trade performance. In 2015, all economic sectors are expected to expand, albeit at a more moderate pace. Overall, the Malaysian economy is projected to register a steady growth of 4.5 to 5.5% in 2015, supported mainly by a sustained expansion in domestic demand amid strong domestic fundamentals and a resilient export sector (Bank Negara Report, 2014).

The mining sector recorded a growth of 3.1% in 2014 as a result of higher production of natural gas and crude oil. This mainly reflected the commencing of production from a new major oil field, namely Gumusut-Kakap at offshore Sabah.

The construction sector registered a higher growth of 11.6% during the year, owing mainly to stronger growth in both the residential and non-residential sub-sectors. The robust growth in the residential sub-sector was attributed to continued progress in high-end housing projects in Johor, Klang Valley and Penang, while construction activities in the non-residential sub-sector were supported by commercial and industrial projects. The civil engineering sub-sector provided further support to the sector, underpinned by existing and new infrastructure projects.

The manufacturing sector grew at a higher rate of 6.2%, attributable to stronger performance of the export-oriented industries due to recovery in the advanced economies and expansion in the domestic-oriented industries.

## Minerals Production

Generally, the domestic mineral production experienced an increase of 6.81% in total mineral output valued at RM7.39 billion in 2014 compared with RM6.92 billion in 2013. The increased in value was caused by higher production of mainly metallic minerals. The metallic mineral production showed an increase of 23.1% in total metallic mineral output valued at RM3.24 billion in 2014 compared with RM2.63 billion in the previous year. This is due to improved global metallic mineral demand and market prices. Whilst the production for energy mineral decrease slightly at 7.8% to 2.67 million tonnes compare with 2.89 million tonnes in 2013.

The metallic minerals productions in 2014 increased compared to the previous year due to higher global demand and higher prices. The metallic minerals production accounted for 44% share of the total mineral production value. In terms of quantity, the metallic minerals that increased in production were gold (4,308 kg), tin (3,777 tonnes), bauxite (962,799 tonnes), rare earth minerals (455 tonnes), struverite (255 tonnes), zircon (677 tonnes), and silver (533 kg) and; whilst those metallic minerals which decreased in production were manganese (0.84 million tonnes), iron ore 9.6 million tonnes), ilmenite (8,159 tonnes) and rutile (3,069 tonnes).

During 2014, the non-metallic minerals production value showed that it still contributed significantly to the country's mineral production, and only accounted 50.7% share of the total mineral output. The overall non-metallic mineral production value decreased slightly by 0.38% to RM3.75 billion from RM3.76 billion recorded in 2013. In 2014 more than half of the non-metallic minerals had shown an increase in production except for aggregates (136.2 million tonnes), kaolin (219,652 tonnes), sand and gravels (29.86 million tonnes). There was an increase in production recorded for clay and earth materials (30.9 million tonnes), limestone for cement (23.9 million tonnes), feldspar (1.2 million tonnes), silica sand (1.9 million tonnes), and mica (5,659 tonnes).

The production value of the energy mineral sector represented by coal had registered a slightly decrease in production value of RM400 million due to lower coal price in 2014 compared with RM523 million recorded in 2013 with a decreasing total production of 2.7 million tonnes from 2.9 million tonnes in the year before.

## Manufactured Mineral-Based Products

In 2014, the overall production value of selected manufactured mineral-based products registered an increase of 3.7% to RM61.4 billion compared to RM59.2 billion recorded in the previous year.

The metallic mineral-based products increased by 2.6% to RM43 billion compared with RM41.9 billion recorded in 2013; while non-metallic mineral-based products increased by 2.8% to RM18.3 billion compared with RM17.8 billion recorded in 2013. In terms of contribution to the total output value, the metallic mineral-based products accounted for 70.1% and the remaining 29.9% was contributed by non-metallic mineral-based products. Primary iron and steel industry continued to maintain its leading position in term of output value. However, its production value decreased by 0.9% in 2014 to RM21.8 billion from RM22 billion in 2013. Whereas, the production value of aluminium and other basic precious and non-ferrous metal increased to RM7.6 billion compared with RM6.1 billion in year 2013. Tin smelting experienced an increment to RM2.5 billion from RM2.3 billion in the previous year. The value of other fabricated metal products showed an increase of 15.8% to RM2.2 billion in 2014 compared with RM1.9 billion in the previous year.

During 2014, the overall output value of manufactured non-metallic mineral-based products registered an increase of 2.8% to RM18.3 billion from RM17.8 billion in the previous year. The main industries contributing to the non-metallic mineral-based products were hydraulic cement, flat glass, including wired, coloured or tinted flat glass and other glass products (glass products industries), and ready-mix and dry-mix concrete and mortars industries. The production value for hydraulic cement products registered an increase of 9.2% to RM6 billion. Glass products industries experienced an increase of 10.3% to RM3.2 billion in 2014 compared with RM2.9 billion in the previous year. Whilst the production value for other non-metallic mineral products showed a decrease of 5.6% to RM1.5 billion from RM1.6 billion in the previous year.

2

## Export and Import of Minerals

The total mineral export value in 2014 registered an overall increase of 7.6% to RM2.48 billion compared with RM2.31 billion in 2013.

The main minerals exported were metallic minerals which contributed about 80.2%, non-metallic minerals 17.5% and coal export remains at about 2.3%. The major minerals exported during the year were iron ore, copper, bauxite, limestone flux, aggregates, coal and clay minerals.

The export value of metallic mineral ores and concentrates in the year 2014 registered an increase of 13% to RM1,991.4 million compared with RM1,764.7 million in 2013. The increase was contributed largely due to the jump in the export of bauxite amounting to RM347.7 million and copper ore concentrate to RM204.2 million.

The export value of non-metallic minerals decreased by 2% to RM434.0 million compared with RM443 million recorded in 2013. This was contributed mainly by the decrease in the export of rock aggregates. Rock aggregates exports decreased to RM122.3 million in 2014 from RM144.5 million registered in 2013. Export of clay minerals value also decreased to RM53.6 million, compared with RM68.5 million in 2013.

The export value of energy mineral in 2014 recorded a huge decrease to RM58.0 million in 2013 compared with RM100.7 million in 2013.

During 2014, the overall import value of minerals recorded a decrease of 4.5% to RM9.1 billion compared with RM9.5 billion in 2013. Only metallic minerals registered an increase in import value of RM3,351.4 million in the year. In terms of percentage, the biggest share of minerals imported was coal which accounted for 56.5%, metallic minerals, 37% and non-metallic minerals, 6.5%.

The major mineral commodities imported in 2014 was coal, with a value of RM5.1 billion; iron ore (RM1.6 billion), tin ore and concentrate (RM1.3 billion), copper ore and concentrate (RM162.2 million), phosphate (RM154.0 million), gypsum (RM105.8 million), kaolin (RM68.6 million) and clay and other refractory minerals (RM66.1 million) and barytes (RM60.2 million).

### Export and Import of Mineral-Based Products

In 2014, the overall export value of major mineral-based products decreased by 10.5% to RM30.7 billion compared with RM34.3 billion in 2013. About 88.9% of the exported mineral-based products were of metallic-based mineral and 11.1% were of non-metallic. The export value for metallic mineral-based products decreased 11.6% from the previous year to RM27.3 billion. In contrast, the export value of non-metallic mineral-based products decreased 1.0% to RM3.4 billion.

The major metallic mineral-based products exported in 2014 were iron and steel products with a value of RM9.5 billion; copper-based products valued at RM6.90 billion; aluminium-based products (RM5.5 billion), followed by tin metal (RM2.52 billion) and non-monetary gold (RM1.32 billion). Exports of iron and steel and aluminium based products increased in 2014 compared to the previous year while exports of copper-based and tin-based products decreased during the same period.

Non-metallic mineral-based products export value decreased by 1.0% to RM3.40 billion in 2014 compared with RM3.43 billion in 2013. Glass and glassware products were the major export contributors during the year with glass showed an increase of 15.4% in value to RM0.98 billion compare to RM0.85 billion in the previous year. Whilst glassware products showed a decrease of 24.6% in value to RM0.73 billion compared with RM0.96 billion in 2013. Other major non-metallic minerals-based products exported were clay-based and ceramic products, with a value of RM605.9 million; cement (RM452.9 million), pottery (RM255.3 million), lime (RM151.6 million) and limestone flux (RM145.7 million). Other related products exported in 2014 include activated clay (RM48.8 million) and monumental or building stone (RM20.3 million).

The total import value of mineral-based products in 2014 decreased by 17.5% to RM53.4 billion compared with RM64.8 billion in 2013. The total import value of metallic mineral-based products showed a decrease of 19.4% to RM49.1 billion from RM60.9 billion, whilst the non-metallic mineral-based products recorded an increase of 7.7% to RM4.2 billion in 2014 compared with RM3.9 billion in 2013.

The main metallic mineral-based products imported were iron and steel (RM24.07 billion), non-monetary gold (RM10.93 billion), copper-based (RM10.16 billion), tin-based (RM1.26 billion) and zinc-based (RM1.15 billion). Whilst, the main non-metallic mineral-based products imported during the year were glass (RM1,744.8 million), glassware (RM775.9 million), cement (RM727.8 million), clay-based and ceramics products (RM627.8 million), pottery (RM158 million) and monumental or building stone (RM152.8 million).

### Mineral Exploration Activities

In 2014, the Minerals and Geoscience Department continued its mineral exploration and resources evaluation activity for metallic, non-metallic and energy minerals. Follow-up and detailed geochemical surveys over previously identified anomalous areas for selected metallic minerals were carried out. As a result, several potential localities for gold, tin and ilmenite were delineated. Resource evaluations

for non-metallic minerals in several states have identified significant reserves of rock aggregate, construction sand, limestone, silica rock, andalusite and clay. For energy mineral, coal reserve evaluation in Sabah and Sarawak has identified several potential coal occurrences and reserves.

In 2014, reconnaissance survey for metallic mineral resources were carried out at Mahang and Ulu Muda in Kedah (Tin), Bukit Manisan in Johor and Port Dickson in Negeri Sembilan (Iron) and Hose Mountains, Kapit in Sarawak (Base metals), covering a total area of 694 km<sup>2</sup>. The study reported that there are several good geochemical indications for tin, iron and gold.

Follow-up and detailed geochemical surveys for metallic mineral resources covering a total area of 235.5 km<sup>2</sup> have delineated several potential areas for gold at Kuala Betis, Gua Musang in Kelantan, Sungai Kerak, Lipis in Pahang and Gunung Andrassy, Tawau in Sabah and tin at Sungai Lui, Hulu Langat in Selangor. Reserve of ilmenite (3,060 tonnes) has been identified in Sungai Cheniah, Dungun in Terengganu.

Resource evaluations were carried out for non-metallic minerals in several states of Peninsular Malaysia, Sabah and Sarawak with a total area coverage of 269 km<sup>2</sup>. The study has identified 0.66 million tonnes of andalusite (Sungai Kemaman, Terengganu), 978 million tonnes of rock aggregate (Kulaijaya, Kota Tinggi Johor and Tunoh, Kapit, Sarawak), 39 million tonnes of limestone (Gua Panjang, Merapoh, Pahang), 123.3 million tonnes of silica rock (Kuala Betis, Gua Musang and Kg. Berdang, Jeli, Kelantan, Ulu Rokan, Gemencheh, Negeri Sembilan and Ijok, Selama, Perak), 123.5 million tonnes of clay (Kepis, Kuala Pilah, Negeri Sembilan and Sepang, Selangor) and 25.6 million tonnes of construction sand (Sungai Pahang, Pahang and Sungai Pegalan, Keningau, Sabah). Other non-metallic minerals investigated during the year were volcanic ash in Padang Sanai, Kuala Nerang, Padang Terap in Kedah, dolomite in Bukit Mata Ayer-Bukit Ngolang, Padang Besar in Perlis and feldspar in Gunung Pueh-Tanjung Batu, Lundu in Sarawak and Lawin, Hulu Perak in Perak.

4

For energy mineral, coal resources evaluations were carried out in Sabah and Sarawak covering an area of 100 km<sup>2</sup> and 80 km<sup>2</sup>, respectively. Coal exploration in Sabah involved the assessment of coal resources at Serudong block in Tawau and Lambunan block in Sandakan. The study has successfully established two coal seams in the Serudong block and three coal seams in the Lambunan block with a total resource of 9.58 million tonnes. Laboratory analyses show that coal in the Serudong block is of high volatile A bituminous rank while coal in the Lambunan block ranges from high volatile C bituminous to high volatile A bituminous in rank. In Sarawak, coal exploration was conducted in the Tunoh block in the Hose Mountains area, Kapit and in Melikin block, Serian. Thirty three coal outcrops ranging in thickness from 0.13 m to 2.30 m were found in the Tunoh block, while eight coal outcrops ranging in thickness from 0.2 m to 1.6 m were found in the Melikin block. One coal seam with an estimated resource of 34 million tonnes has been identified in the Tunoh block. Laboratory tests indicate that the coal in the Tunoh block is of high volatile C bituminous in rank, whereas in the Melikin block, it is of low volatile bituminous in rank.

Heavy rare earth elements (HREE) exploration project was started in 2014 and has been conducted in four states, namely Negeri Sembilan, Pahang, Perak and Terengganu. The project is a collaborative effort between the Minerals and Geoscience Department Malaysia and the Academy of Sciences Malaysia. This project is aimed at finding heavy rare earth elements contained in monazite (Ce,La,Y,Th) PO<sub>4</sub>, allanite (Ca,Ce,Th)<sub>2</sub>(Al,Fe,Mg)<sub>3</sub>Si<sub>3</sub>O<sub>12</sub>(OH), bastnaesite (Ce,Th,La,Y,Ca)(CO<sub>3</sub>)F, euxenite (Y,Ca,Er,La,Ce,U,Th)(Nb,Ta,Ti)<sub>2</sub>O<sub>6</sub> and xenotime (YPO<sub>4</sub>). No findings have been reported yet.

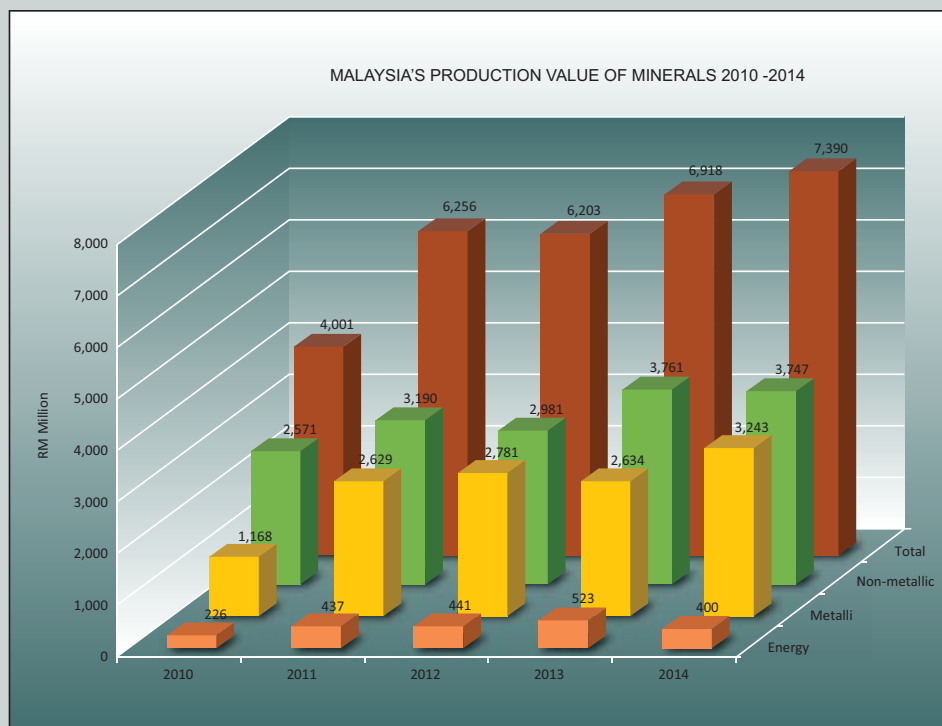
# Minerals in Brief



### MALAYSIA'S MINERALS PRODUCTION 2013 - 2014

| Mineral                      | 2013                                   |                       | 2014                                   |                       |
|------------------------------|--|-----------------------|--|-----------------------|
|                              | Tonnes<br>(unless stated<br>otherwise) | Value<br>(RM Million) | Tonnes<br>(unless stated<br>otherwise) | Value<br>(RM Million) |
| <b>Energy Minerals</b>       |  |                       |  |                       |
| Coal                         | 2,893,963                              | 523.34                | 2,667,764                              | 400.16                |
| <b>Total</b>                 |  | <b>523.34</b>         |  | <b>400.16</b>         |
| <b>Metallic Minerals</b>     |  |                       |  |                       |
| Iron ore                     | 12,134,250                             | 1,689.80              | 9,615,323                              | 2,252.87              |
| Gold (gm)                    | 3,822,708                              | 535.18                | 4,308,329                              | 555.26                |
| Tin-in-concentrates          | 3,697                                  | 258.79                | 3,777                                  | 257.21                |
| Manganese                    | 1,125,127                              | 112.51                | 835,429                                | 83.54                 |
| Bauxite                      | 208,770                                | 16.70                 | 962,799                                | 77.02                 |
| Ilmenite                     | 16,043                                 | 8.02                  | 8,159                                  | 4.08                  |
| Rare earth minerals          | 358                                    | 2.86                  | 455                                    | 3.97                  |
| Struverite                   | 190                                    | 3.04                  | 255                                    | 4.08                  |
| Rutile                       | 5,983                                  | 5.35                  | 3,069                                  | 2.30                  |
| Zircon                       | 379                                    | 1.14                  | 677                                    | 2.03                  |
| Silver (gm)                  | 360,828                                | 1.05                  | 533,391                                | 0.98                  |
| <b>Total</b>                 |  | <b>2,634.44</b>       |  | <b>3,243.34</b>       |
| <b>Non-Metallic Minerals</b> |  |                       |  |                       |
| Aggregates                   | 153,173,000                            | 2,528.41              | 136,161,663                            | 2,439.63              |
| Sand and gravel              | 35,576,000                             | 553.24                | 29,862,000                             | 495.25                |
| Limestone (for cement)       | 18,068,782                             | 314.73                | 23,948,121                             | 350.78                |
| Clay & earth materials       | 29,830,904                             | 254.25                | 30,867,482                             | 261.80                |
| Silica sand                  | 1,243,660                              | 52.78                 | 1,922,874                              | 99.83                 |
| Kaolin                       | 293,480                                | 28.81                 | 219,652                                | 15.80                 |
| Feldspar                     | 314,399                                | 25.05                 | 1,202,728                              | 65.64                 |
| Mica                         | 4,363                                  | 3.49                  | 5,659                                  | 3.11                  |
| Barytes                      | 500                                    | 0.25                  | 14,456*                                | 14.93*                |
| <b>Total</b>                 |  | <b>3,761.01</b>       |  | <b>3,746.77</b>       |
| <b>Grand total</b>           |  | <b>6,918.79</b>       |  | <b>7,390.27</b>       |

\* - Reproduction from imported raw material.





**STATISTIC OF SELECTED MINERAL-BASED MANUFACTURING INDUSTRIES**

| Industry code       | Raw material  | Sales value of own manufactured products (Ex-factory, RM '000) |                   |
|---------------------|---|--|-------------------|
|                     |   | 2013   | 2014              |
| <b>Metallic</b>     |   |  |                   |
| 24101               | Pig iron and spiegeleisen in pigs, blocks or other primary forms  |  |                   |
| 24102               | Bars and rods of stainless steel or other alloy steel   | 21,983,107   | 21,765,983        |
| 24103               | Seamless tubes, by hot rolling, hot extrusion or hot drawing, by cold drawing or cold rolling                 |  |                   |
| 24109               | Other basic iron and steel products n.e.c   |  |                   |
| 24201               | Tin smelting*   | 2,340,586  | 2,498,533         |
| 24202               | Aluminium from alumina  | 6,127,640  | 7,592,746         |
| 24209               | Other basic precious and other non-ferrous metals n.e.c   |  |                   |
| 25992               | Metal cable, plaited bands and similar articles   | 3,875,690  | 3,797,793         |
| 25993               | Bolts, screws, nuts and similar threaded products   |  |                   |
| 25991               | Tin and cans for food products, collapsible tubes and boxes   | 2,125,979  | 2,219,850         |
| 25113               | Metal doors, windows and their frames, shutters and gates   | 1,998,397  | 1,892,114         |
| 25119               | Other structural metal products   |  |                   |
| 25994               | Metal household articles  | 1,239,249  | 1,049,246         |
| 25999               | Other fabricated metal products   | 1,900,801  | 2,227,749         |
|                     | <b>Sub-total</b>  | <b>41,908,980</b>  | <b>43,044,014</b> |
| <b>Non-metallic</b> |   |  |                   |
| 23101               | Flat glass, including wired, coloured or tinted flat glass  | 2,900,579  | 3,217,451         |
| 23109               | Other glass products n.e.c  |  |                   |
| 23911               | Refractory mortars and concretes  | 1,931,288  | 1,962,549         |
| 23921               | Non-refractory ceramic  |  |                   |
| 23930               | Other porcelain and ceramic products  | 432,249  | 430,934           |
| 23941               | Hydraulic cement  | 5,508,593  | 6,015,290         |
| 23951               | Ready-mix and dry-mix concrete and mortars  | 3,171,404  | 3,032,636         |
| 23952               | Precast concrete, cement or artificial stone articles for use in construction                                 | 2,261,756  | 2,139,579         |
| 23953               | Prefabricated structural components for building or civil engineering of cement, concrete or artificial stone |  |                   |
| 23959               | Other articles of concrete, cement and plaster n.e.c  |  |                   |
| 23990               | Other non-metallic mineral products n.e.c   | 1,608,613  | 1,518,178         |
|                     | <b>Sub-total</b>  | <b>17,814,482</b>  | <b>18,316,617</b> |
|                     | <b>Total Value</b>  | <b>59,176,736</b>  | <b>61,360,631</b> |

Source: Monthly Manufacturing Statistics Malaysia, January 2015, Department of Statistics  
\* Minerals and Geoscience Department Malaysia

## EXPORT AND IMPORT VALUE OF MAJOR MINERALS

| Minerals                                       | 2013 RM              |                      | 2014 RM              |                      |
|--|----------------------|----------------------|----------------------|----------------------|
|  | Export               | Import               | Export               | Import               |
| <b>Metallic</b>                                |                      |                      |                      |                      |
| Iron ore (SITC: 281)                           | 1,464,507,000        | 1,086,669,000        | 1,389,691,093        | 1,590,093,563        |
| Copper ore and concentrate (SITC: 283-100-000) | 144,060,000          | 355,636,000          | 204,181,014          | 162,157,384          |
| Bauxite (SITC: 285-100-000)                    | 7,786,000            | 6,964,000            | 347,710,574          | 44,713,774           |
| Ilmenite (SITC: 287-830-100)                   | 4,142,000            | 66,947,000           | 340,754              | 80,606,652           |
| Monazite (SITC: 286-200-000)                   | 1,594,000            | –                    | 2,018,670            | –                    |
| Columbite (SITC: 287-850-110)                  | –                    | –                    | –                    | –                    |
| Zircon and concentrate (SITC: 287-840-100)     | 141,494,118          | 201,972,000          | 38,444,508           | 74,081,354           |
| Tin ore and concentrate (SITC: 287-600-000)    | 1,129,000            | 1,138,959,000        | 2,518,772            | 1,341,705,159        |
| Lead ore and concentrate (SITC: 287-400-000)   | 29,000               | 6,000                | 6,528,169            | 58,005,930           |
| <b>Sub-total</b>                               | <b>1,764,741,118</b> | <b>2,857,153,000</b> | <b>1,991,433,554</b> | <b>3,351,363,816</b> |
| <b>Non-metallic</b>                            |                      |                      |                      |                      |
| Phosphate (SITC: 272-3)                        | 8,860                | 178,577,000          | 160,852              | 153,976,012          |
| Dimension stone (SITC: 273-1)                  | 16,563,000           | 29,672,000           | 11,950,412           | 28,743,834           |
| Limestone flux (SITC: 273-220-000)             | 111,725,000          | 802,000              | 145,678,415          | 811,631              |
| Gypsum (SITC: 273-230-000)                     | 1,187,000            | 103,684,000          | 584,696              | 105,756,498          |
| Silica sand (SITC: 273-310-000)                | 44,542,000           | 13,092,000           | 44,793,192           | 15,204,662           |
| Sand & gravels (SITC: 273-390-000)             | 1,612,000            | 7,242,000            | 3,988,584            | 7,011,962            |
| Aggregates (SITC: 273-4)                       | 144,510,000          | 26,372,000           | 122,274,175          | 26,070,769           |
| Clay & other refractory min. (SITC: 278-2)     | 68,510,000           | 190,761,000          | 53,561,584           | 66,084,148           |
| Kaolin (SITC: 278-260-000)                     | 26,461,000           | 66,480,000           | 27,101,250           | 68,616,368           |
| Mica powder (SITC: 278-522-000)                | 9,192,000            | 4,849,000            | 9,106,339            | 5,136,513            |
| Feldspar (SITC: 278-53)                        | 16,132,000           | 44,366,000           | 11,903,758           | 53,533,988           |
| Barytes (SITC: 278-921-000 & 278-922-000)      | 2,534,000            | 134,170,000          | 2,920,601            | 60,182,793           |
| <b>Sub-total</b>                               | <b>442,976,860</b>   | <b>800,067,000</b>   | <b>434,023,858</b>   | <b>591,129,178</b>   |
| <b>Energy</b>                                  |                      |                      |                      |                      |
| Coal (SITC: 321)                               | 100,702,000          | 5,842,421,000        | 58,033,470           | 5,128,270,464        |
| <b>Sub-total</b>                               | <b>100,702,000</b>   | <b>5,842,421,000</b> | <b>58,033,470</b>    | <b>5,128,270,464</b> |
| <b>Total Value</b>                             | <b>2,308,419,978</b> | <b>9,499,641,000</b> | <b>2,483,490,882</b> | <b>9,070,763,458</b> |

Source: Department of Statistics

## EXPORT VALUE OF MAJOR MINERAL-BASED PRODUCTS

| Commodity  | 2013<br>Ringgit (RM)  | 2014 <sup>P</sup><br>Ringgit (RM) |
|--|-----------------------|-----------------------------------|
| <b>Metallic Product</b>                            |                       |                                   |
| Copper-based (SITC: 682)                           | 10,350,152,000        | 6,923,234,993                     |
| Iron & steel (SITC: 671 to 679)                    | 7,401,714,000         | 9,506,556,705                     |
| Aluminium-based (SITC: 684)                        | 4,842,944,997         | 5,455,646,791                     |
| Tin-based (SITC: 687) other than SITC: 687-110-000 | 2,648,095,000         | 166,760,537                       |
| Tin metal (SITC: 687-110-000)                      | 2,525,691,000         | 2,523,547,228                     |
| Lead-based (SITC: 685)                             | 891,604,000           | 483,352,258                       |
| Zinc-based (SITC: 686)                             | 606,182,000           | 402,388,961                       |
| Titanium dioxide pigments (SITC: 533-11)           | 476,747,000           | 485,252,347                       |
| Titanium oxides (SITC: 522-560-000)                | 22,505,000            | 12,028,816                        |
| Gold, non-monetary (SITC: 971)                     | 1,102,110,000         | 1,322,187,119                     |
| <b>Sub-total</b>                                   | <b>30,867,744,997</b> | <b>27,280,955,755</b>             |
| <b>Non-metallic Product</b>                        |                       |                                   |
| Glassware (SITC: 665)                              | 962,357,000           | 725,860,944                       |
| Glass (SITC: 664)                                  | 851,668,000           | 983,238,609                       |
| Clay-based and ceramics (SITC: 662)                | 603,903,000           | 605,914,581                       |
| Cement (all types) (SITC: 661-2)                   | 504,333,000           | 452,878,346                       |
| Pottery (SITC: 666)                                | 173,925,000           | 255,283,742                       |
| Lime (SITC: 661-1)                                 | 140,052,000           | 151,589,079                       |
| Activated clay (SITC: 598-650-100)                 | 50,810,000            | 48,796,573                        |
| Monumental or building stone (SITC: 661)           | 19,748,000            | 20,327,887                        |
| Limestone flux (SITC: 273-220-000)                 | 111,725,231           | 145,678,415                       |
| Dimension stone block (SITC: 273-1)                | 16,466,439            | 12,030,662                        |
| <b>Sub-total</b>                                   | <b>3,434,987,670</b>  | <b>3,401,598,838</b>              |
| <b>Total Export Value</b>                          | <b>34,302,732,667</b> | <b>30,682,554,593</b>             |

Source: Department of Statistics

## IMPORT VALUE OF MAJOR MINERAL-BASED PRODUCTS

| Commodity  | 2013<br>Ringgit (RM)  | 2014 <sup>P</sup><br>Ringgit (RM) |
|--|-----------------------|-----------------------------------|
| <b>Metallic Product</b>                              |                       |                                   |
| Iron & steel (SITC: 671 to 679)                      | 23,659,919,897        | 24,066,207,383                    |
| Copper-based (SITC: 682)                             | 17,112,438,644        | 10,163,659,987                    |
| Gold, non-monetary (SITC: 971)                       | 11,399,880,776        | 10,930,371,050                    |
| Aluminium-based (SITC: 684)                          | 5,244,469,000         | 7,060,798                         |
| Tin-based (SITC: 687) other than (SITC: 687-110-000) | 1,127,658,614         | 1,257,041,642                     |
| Tin metal (SITC: 687-110-000)                        | 818,064,000           | 491,465,617                       |
| Zinc-based (SITC: 686)                               | 561,929,899           | 1,151,145,914                     |
| Titanium dioxide pigments (SITC: 533-1)              | 438,123,000           | 390,258,458                       |
| Lead-based (SITC: 685)                               | 434,384,583           | 617,768,674                       |
| Titanium oxides (SITC: 522-560-000)                  | 65,482,000            | 64,564,692                        |
| <b>Sub-total</b>                                     | <b>60,862,350,413</b> | <b>49,139,544,215</b>             |
| <b>Non-metallic Product</b>                          |                       |                                   |
| Glass (SITC: 664)                                    | 1,735,133,000         | 1,744,799,917                     |
| Cement (all types) (SITC: 661-2xx)                   | 707,891,000           | 727,798,826                       |
| Glassware (SITC: 665)                                | 678,654,000           | 775,892,145                       |
| Clay-based and ceramics (SITC: 662)                  | 492,819,000           | 627,814,157                       |
| Monumental or building stone (SITC: 661-3)           | 129,468,488           | 152,794,394                       |
| Pottery (SITC: 666)                                  | 111,457,000           | 158,035,433                       |
| Dimension stone block (SITC: 273-1)                  | 24,150,000            | 28,743,834                        |
| Activated clay (SITC: 598-650-100)                   | 15,074,000            | 8,412,407                         |
| Lime (SITC: 661-1)                                   | 10,532,000            | 7,673,291                         |
| Limestone flux (SITC: 273-220-000)                   | 802,000               | 811,631                           |
| <b>Sub-total</b>                                     | <b>3,905,980,488</b>  | <b>4,232,776,035</b>              |
| <b>Total Import Value</b>                            | <b>64,768,330,901</b> | <b>53,372,320,250</b>             |

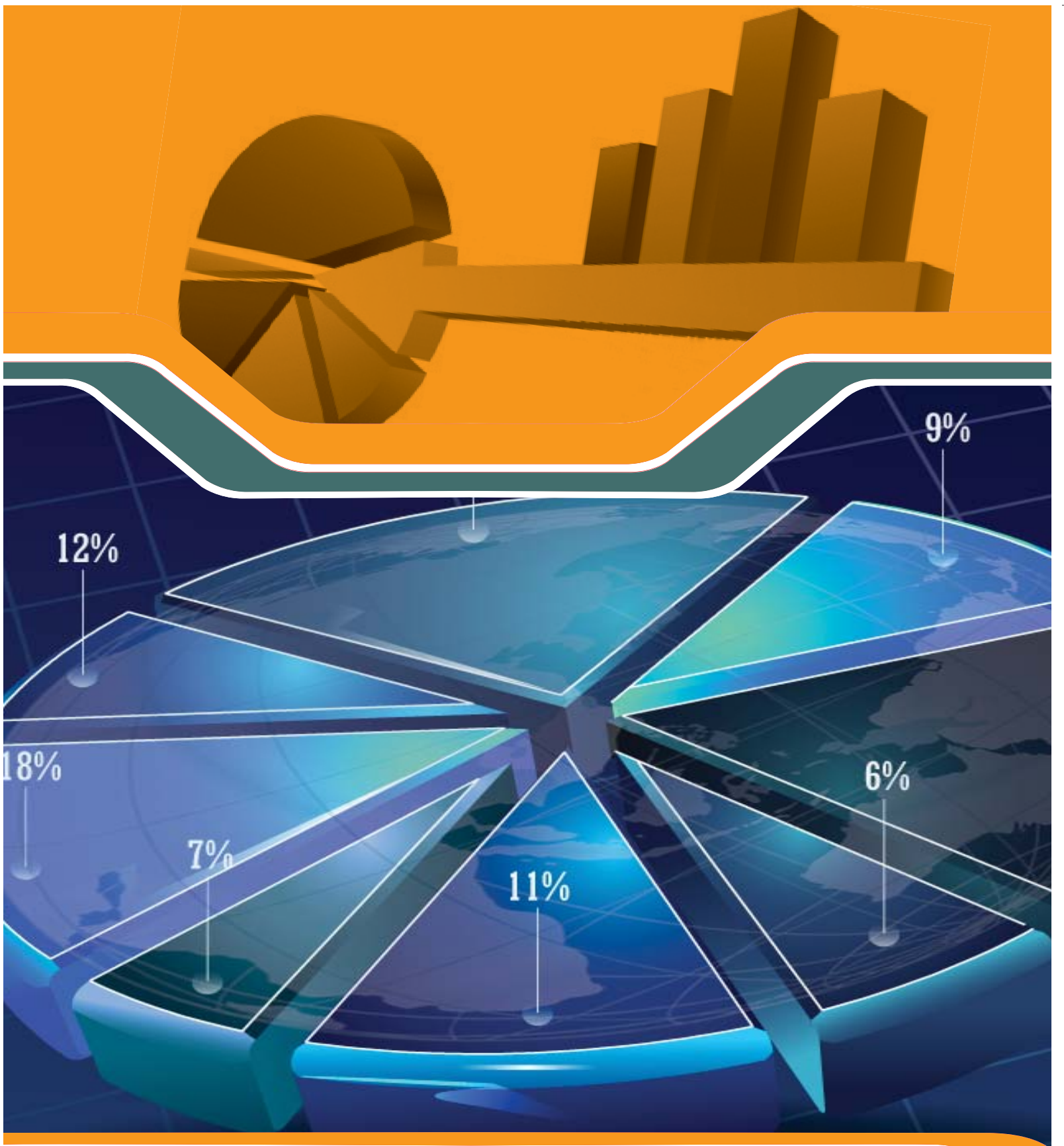
Source: Department of Statistics

## SUMMARY OF MALAYSIAN PRODUCTION OF MINERAL COMMODITIES 2014

| Commodity                    | Unit   | Johor      | Kedah     | Kelantan  | Melaka    | N.Sembilan | Pahang    | Perak      | Perlis    | P.Pinang  | Selangor/KL | Terengganu | Sabah     | Sarawak    | Total       |
|------------------------------|--------|------------|-----------|-----------|-----------|------------|-----------|------------|-----------|-----------|-------------|------------|-----------|------------|-------------|
| <b>Metallic minerals</b>     |        |            |           |           |           |            |           |            |           |           |             |            |           |            |             |
| Bauxite                      | tonnes | 267,659    | –         | –         | –         | –          | 695,140   | –          | –         | –         | –           | –          | –         | –          | 962,799     |
| Gold                         | grams  | –          | –         | 1,027,767 | –         | –          | 3,278,757 | –          | –         | –         | –           | 1,805      | –         | –          | 4,308,329   |
| Iron Ore                     | tonnes | 1,394,403  | 382,333   | 526,927   | –         | 82,300     | 6,592,605 | –          | –         | –         | –           | 636,751    | –         | –          | 9,615,319   |
| Manganese                    | tonnes | –          | –         | 679,429   | –         | –          | 156,000   | –          | –         | –         | –           | –          | –         | –          | 835,429     |
| REM (Monazite)*              | tonnes | –          | –         | –         | –         | –          | –         | 372        | –         | –         | –           | –          | –         | –          | 372         |
| REM (Xenotime)*              | tonnes | –          | –         | –         | –         | –          | –         | 83         | –         | –         | –           | –          | –         | –          | 83          |
| Silver                       | grams  | –          | –         | –         | –         | –          | 533,391   | –          | –         | –         | –           | –          | –         | –          | 533,391     |
| Tin-in-concentrates          | tonnes | 230        | 15        | –         | –         | –          | 356       | 3,142      | –         | –         | 4           | 22         | –         | –          | 3,777       |
| Ilmenite*                    | tonnes | –          | –         | –         | –         | –          | –         | 8,159      | –         | –         | –           | –          | –         | –          | 8,159       |
| Rutile*                      | tonnes | –          | –         | –         | –         | –          | –         | 3,069      | –         | –         | –           | –          | –         | –          | 3,069       |
| Zircon*                      | tonnes | –          | –         | –         | –         | –          | –         | 677        | –         | –         | –           | –          | –         | –          | 677         |
| <b>Non-metallic minerals</b> |        |            |           |           |           |            |           |            |           |           |             |            |           |            |             |
| Aggregates                   | tonnes | 39,612,296 | 4,580,397 | 2,373,159 | 2,697,476 | 15,403,541 | 3,717,945 | 17,338,196 | 356,274   | 6,530,470 | 27,550,186  | 679,491    | 4,735,705 | 10,586,528 | 136,161,663 |
| Barytes+                     | tonnes | –          | –         | –         | –         | –          | –         | –          | –         | –         | –           | 14,456     | –         | –          | 14,456      |
| Clay & earth mat.            | tonnes | 7,685,896  | 4,881,254 | 212,687   | 569,799   | 2,078,127  | 2,088,530 | 4,758,000  | 2,424,819 | 11,000    | 1,244,729   | 2,537,641  | 565,000   | 1,810,000  | 30,867,482  |
| Feldspar                     | tonnes | –          | –         | 1,189,948 | –         | 12,780     | –         | –          | –         | –         | –           | –          | –         | –          | 1,202,728   |
| Kaolin                       | tonnes | 30,073     | –         | –         | –         | –          | 87,000    | 102,579    | –         | –         | –           | –          | –         | –          | 219,652     |
| Limestone                    | tonnes | –          | 3,682,071 | –         | –         | 5,033,941  | 1,431,599 | 9,831,000  | 2,047,483 | –         | 1,904,027   | –          | –         | 18,000     | 23,948,121  |
| Mica                         | tonnes | –          | –         | –         | –         | –          | –         | 5,659      | –         | –         | –           | –          | –         | –          | 5,659       |
| Sand & gravel                | tonnes | 6,043,000  | 1,967,000 | 463,000   | 246,000   | 1,870,000  | 2,333,000 | 7,615,000  | –         | 7,000     | 4,996,000   | 722,000    | 600,000   | 3,000,000  | 29,862,000  |
| Silica sand                  | tonnes | 1,252,240  | –         | –         | –         | –          | –         | 459,000    | –         | –         | 7,634       | –          | –         | 204,000    | 1,922,874   |
| <b>Energy minerals</b>       |        |            |           |           |           |            |           |            |           |           |             |            |           |            |             |
| Coal                         | tonnes | –          | –         | –         | –         | –          | –         | –          | –         | –         | –           | –          | –         | 2,667,764  | 2,667,764   |

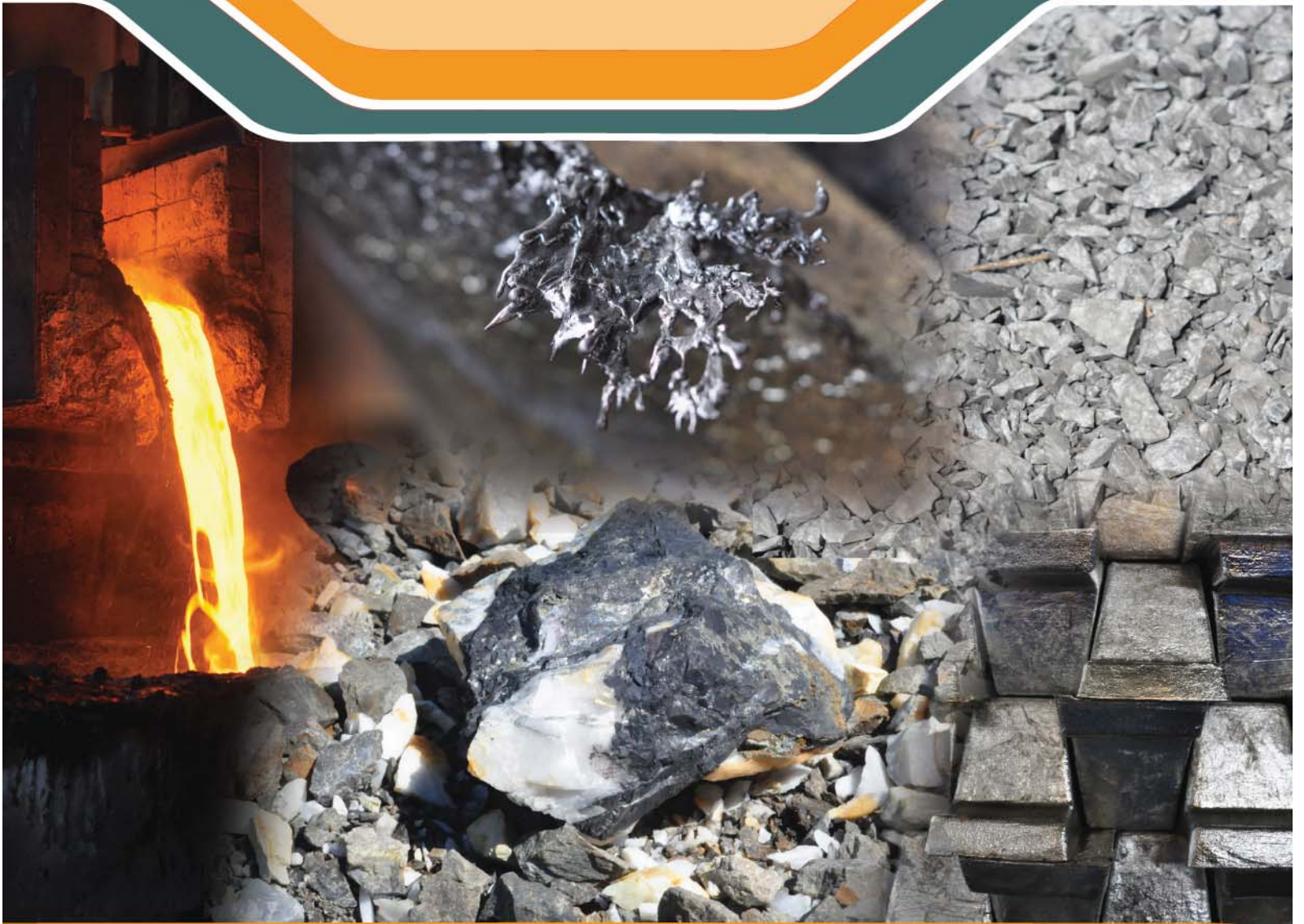
Notes:

- + Reproduction from imported raw material
- Selangor's production includes Federal Territory of Kuala Lumpur
- Aggregates production includes crushed limestone
- Aggregates production in Sabah and Sarawak includes gravel
- Clay production refers to clay and earth materials production
- Limestone production includes limestone for aggregate, cement and agriculture but excludes dimension stone
- Silica production includes silica sand, sand as by-product of tin mining and crushed quartz rock
- REM = Rare Earth Mineral
- \* By-product includes production from mineral processing (amang) plants only



# COMMODITY REVIEWS

# Metallic Minerals



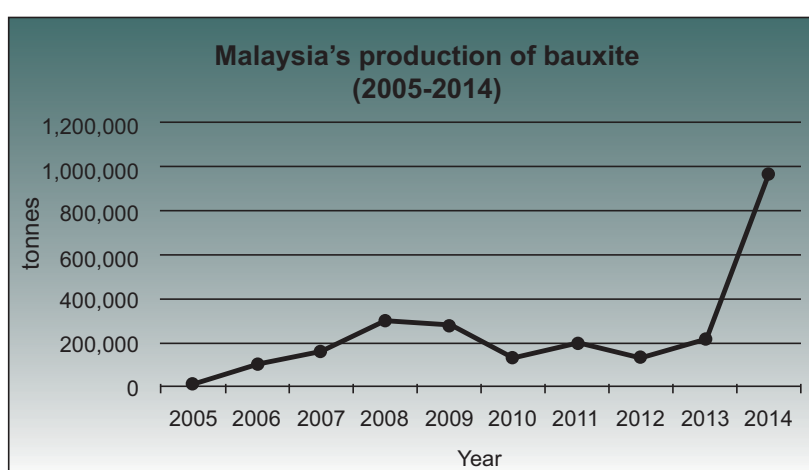
## ALUMINIUM

### Malaysia's production of bauxite 2011 - 2014

| State        | 2011           |          | 2012           |          | 2013           |          | 2014           |          |
|--------------|----------------|----------|----------------|----------|----------------|----------|----------------|----------|
|              | tonnes         | mines    | tonnes         | mines    | tonnes         | mines    | tonnes         | mines    |
| Johor        | 188,141        | 2        | 121,873        | 2        | 208,770        | 1        | 267,659        | 1        |
| Pahang       | –              | –        | –              | –        | –              | –        | 695,140        | 1        |
| <b>Total</b> | <b>188,141</b> | <b>2</b> | <b>121,873</b> | <b>2</b> | <b>208,770</b> | <b>1</b> | <b>962,799</b> | <b>2</b> |

### Malaysia's historic production (bauxite)

| Year | tonnes  |
|------|---------|
| 2005 | 4,735   |
| 2006 | 91,806  |
| 2007 | 156,785 |
| 2008 | 295,176 |
| 2009 | 274,456 |
| 2010 | 124,274 |
| 2011 | 188,141 |
| 2012 | 121,873 |
| 2013 | 208,770 |
| 2014 | 962,799 |



14

### External Trade

#### Exports

| H.S. | Commodity               | tonnes  |         |                   | RM '000   |           |                   |
|------|-------------------------|---------|---------|-------------------|-----------|-----------|-------------------|
|      |                         | 2012    | 2013    | 2014 <sup>P</sup> | 2012      | 2013      | 2014 <sup>P</sup> |
| 2606 | Aluminium ores & conc.  | 19,339  | 17,422  | 3,676,876         | 6,840     | 7,552     | 347,711           |
| 2818 | Alumina & Al hydrate    | 747     | 5,285   | 1,492             | 732       | 19,254    | 2,867             |
| 7601 | Unwrought (a)           | 506,602 | 399,069 | 522,477           | 2,097,492 | 2,666,154 | 3,617,704         |
| 7602 | Waste & scrap           | 9,227   | 8,874   | 5,065             | 29,176    | 30,816    | 25,882            |
| 7603 | Powder & flakes         | 4,770   | 4,220   | 4,510             | 20,460    | 17,751    | 21,326            |
| 7604 | Bar, rods & profile (a) | 23,803  | 50,862  | 46,936            | 436,971   | 462,308   | 450,301           |
| 7605 | Wire                    | 20,057  | 12,009  | 13,373            | 157,138   | 99,080    | 117,534           |
| 7606 | Plates, sheets & strip  | 7,961   | 19,586  | 29,660            | 127,124   | 591,727   | 266,603           |
| 7607 | Foil                    | 25,104  | 32,233  | 32,608            | 284,079   | 353,185   | 367,064           |
| 7608 | Tubes & pipes (a)       | 2,371   | 17,114  | 11,220            | 92,443    | 175,094   | 139,579           |
| 7609 | Tubes & pipes fitting   | 3,335   | 1,065   | 574               | 58,092    | 37,401    | 18,584            |

Note(s): (a) = including alloys

Source: Department of Statistics



## Commodity Review: Aluminium

### Imports

| H.S. | Commodity                 | tonnes  |         |                   | RM '000   |           |                   |
|------|---------------------------|---------|---------|-------------------|-----------|-----------|-------------------|
|      |                           | 2012    | 2013    | 2014 <sup>P</sup> | 2012      | 2013      | 2014 <sup>P</sup> |
| 2606 | Aluminium ores & conc.    | 4,811   | 5,221   | 11,184            | 6,777     | 6,964     | 44,714            |
| 2818 | Alumina & Al hydrate      | 348,380 | 595,995 | 160,294           | 419,701   | 1,085,499 | 1,825,801         |
| 7601 | Unwrought (a)             | 374,148 | 264,200 | 359,426           | 2,780,088 | 1,823,880 | 2,496,230         |
| 7602 | Waste & scrap             | 74,988  | 70,492  | 88,132            | 356,759   | 282,807   | 360,961           |
| 7603 | Powder & flakes           | 2,206   | 3,360   | 1,291             | 13,220    | 17,278    | 20,464            |
| 7604 | Bars, rods & profiles (a) | 28,437  | 35,954  | 203,231           | 365,506   | 436,897   | 1,582,315         |
| 7605 | Wire                      | 7,211   | 6,610   | 5,972             | 84,903    | 91,303    | 75,657            |
| 7606 | Plates, sheets & strip    | 121,151 | 181,369 | 164,626           | 1,654,778 | 1,908,699 | 1,736,818         |
| 7607 | Foil                      | 24,129  | 29,132  | 28,547            | 446,871   | 592,288   | 660,848           |
| 7608 | Tubes & pipes (a)         | 9,209   | 29,744  | 20,575            | 144,978   | 268,051   | 227,134           |
| 7609 | Tubes & pipes fitting     | 1,864   | 1,266   | 1,497             | 29,873    | 23,439    | 22,015            |

### Malaysia's exports of bauxite, by country

15

| Country                                     | 2012              |                  | 2013              |                  | 2014 <sup>P</sup> |                    |
|---|-------------------|------------------|-------------------|------------------|-------------------|--------------------|
|   | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)         |
| Aluminium ores & conc.<br>(HS: 2606.00.000) |                   |                  |                   |                  |                   |                    |
| China                                       | 16,875            | 6,143,270        | 12,685            | 6,898,689        | 3,665,462         | 346,328,455        |
| Thailand                                    | 450               | 476,550          | 4,500             | 476,550          | 10,910            | 1,283,311          |
| Indonesia                                   | -                 | -                | -                 | -                | 13                | 76,408             |
| Australia                                   | 14                | 16,510           | -                 | -                | 476               | 12,500             |
| Brunei                                      | -                 | -                | -                 | -                | 15                | 9,900              |
| Others                                      | 2,000             | 203,358          | 237               | 177,236          | -                 | -                  |
| <b>Total</b>                                | <b>19,339</b>     | <b>6,839,688</b> | <b>17,422</b>     | <b>7,552,475</b> | <b>3,676,876</b>  | <b>347,710,574</b> |

Source: Department of Statistics

## Malaysia's imports of bauxite, by country

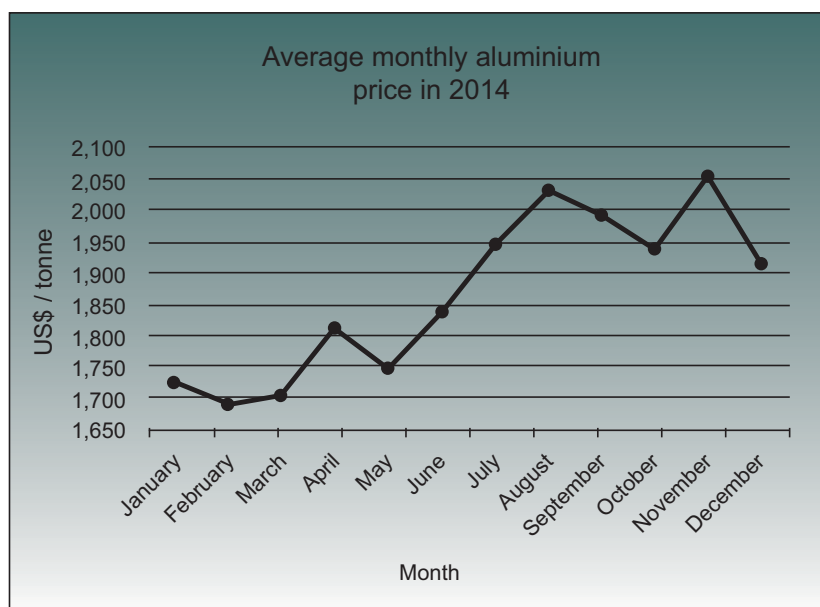
| Country                                     | 2012              |                  | 2013              |                  | 2014 <sup>P</sup> |                   |
|---|-------------------|------------------|-------------------|------------------|-------------------|-------------------|
|   | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)        |
| Aluminium ores & conc.<br>(HS: 2606.00.000) |                   |                  |                   |                  |                   |                   |
| China                                       | 4,460             | 6,159,566        | 4,557             | 5,840,564        | 5,573             | 7,425,035         |
| Saudi Arabia                                | –                 | –                | –                 | –                | 3,664             | 32,817,364        |
| India                                       | 130               | 173,155          | 177               | 208,387          | 1,181             | 3,247,268         |
| Hong Kong                                   | –                 | –                | 150               | 247,143          | 375               | 397,992           |
| Thailand                                    | 197               | 367,550          | 310               | 554,428          | 225               | 366,918           |
| Other                                       | 24                | 76,398           | 27                | 113,773          | 166               | 459,197           |
| <b>Total</b>                                | <b>4,811</b>      | <b>6,776,669</b> | <b>5,221</b>      | <b>6,964,295</b> | <b>11,184</b>     | <b>44,713,774</b> |

## Price

16

## Average monthly aluminium price in 2014

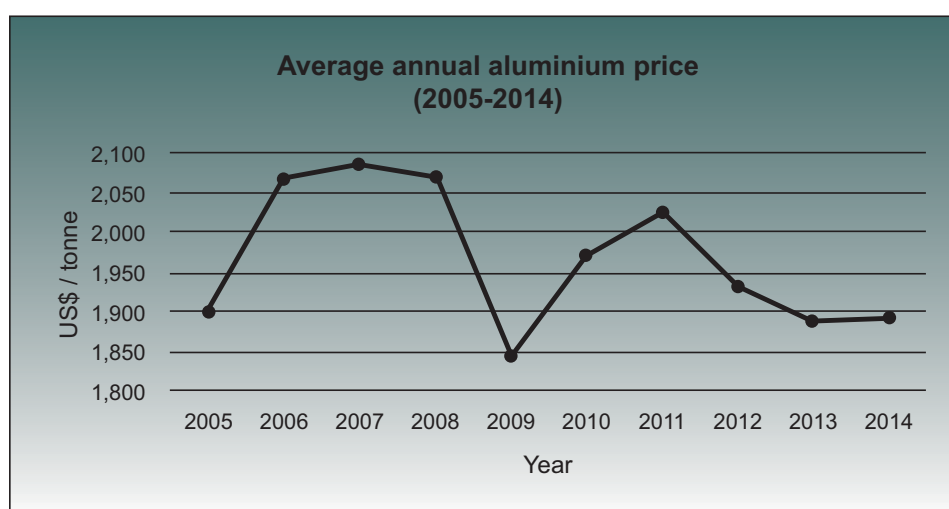
| 2014              | US\$/tonne   |
|-------------------|--------------|
| January           | 1,726        |
| February          | 1,691        |
| March             | 1,704        |
| April             | 1,810        |
| May               | 1,749        |
| June              | 1,836        |
| July              | 1,944        |
| August            | 2,030        |
| September         | 1,992        |
| October           | 1,938        |
| November          | 2,053        |
| December          | 1,913        |
| <b>Annual Avg</b> | <b>1,867</b> |



Source: UNCTAD

## Average annual aluminium price (2005 - 2014)

| Year | US\$/ tonne |
|------|-------------|
| 2005 | 1,898.12    |
| 2006 | 2,569.43    |
| 2007 | 2,637.80    |
| 2008 | 2,572.36    |
| 2009 | 1,664.44    |
| 2010 | 2,172.69    |
| 2011 | 2,397.89    |
| 2012 | 2,019.14    |
| 2013 | 1,845.65    |
| 2014 | 1,866.50    |



London Metal Exchange,  
High Grade, Cash

Source: UNCTAD

World smelter production of bauxite 2012- 2014<sup>P</sup>

| Country                      | tonnes            |                   |                   | % of 2014 <sup>P</sup> |
|------------------------------|-------------------|-------------------|-------------------|------------------------|
|                              | 2012              | 2013              | 2014 <sup>P</sup> |                        |
| China                        | 20,300,000        | 22,100,000        | 23,300,000        | 47.26                  |
| Russia                       | 3,850,000         | 3,720,000         | 3,500,000         | 7.10                   |
| Canada                       | 2,780,000         | 2,970,000         | 2,940,000         | 5.96                   |
| United States                | 2,070,000         | 1,946,000         | 1,720,000         | 3.49                   |
| United Arab Emirates         | 1,820,000         | 1,860,000         | 2,400,000         | 4.87                   |
| Australia                    | 1,860,000         | 1,780,000         | 1,680,000         | 3.41                   |
| India                        | 1,700,000         | 1,700,000         | 2,100,000         | 4.26                   |
| Brazil                       | 1,440,000         | 1,300,000         | 960,000           | 1.95                   |
| Norway                       | 1,150,000         | 1,100,000         | 1,200,000         | 2.43                   |
| Bahrain                      | 890,000           | 913,000           | 930,000           | 1.89                   |
| Iceland                      | 820,000           | 800,000           | 810,000           | 1.64                   |
| South Africa                 | 665,000           | 190,000           | 500,000           | 1.01                   |
| Qatar                        | 604,000           | 600,000           | 610,000           | 1.24                   |
| Mozambique                   | 564,000           | 570,000           | 560,000           | 1.14                   |
| Other countries              | 5,400,000         | 5,510,000         | 6,090,000         | 12.35                  |
| <b>World total (rounded)</b> | <b>45,900,000</b> | <b>47,600,000</b> | <b>49,300,000</b> |                        |

Source: United States Geological Survey

## Review

In 2014, the production of bauxite in Malaysia has increased more than quadrupled to 962,799 tonnes valued at RM77.02 million from 208,770 tonnes in the year before. Malaysia has emerged as one of the world's leading producers of bauxite, the raw ore used for the aluminium manufacture. Malaysia has also become as an important source of bauxite for China since Indonesia banned exports of the mineral, including bauxite, in January 2014. According to consultancy CRU, China required around 130 million tonnes of bauxite in 2014 to feed its fast-growing aluminium industry.

In the past bauxite was mined from the deposit in Pengerang, Johor on a small scale. In 2014, there were two bauxite mines, each operating in Johor and Pahang. Bauxite production in Pahang where a full blown mining operation was going on in Bukit Goh near Gebeng, Kuantan only began in mid-year, but accounted for 72.2% of the total production.

The sharp increase in bauxite production was due to a high demand from the export market to China. In 2014, exports of bauxite amounted to 3.68 million tonnes with a value of RM347.71 million. This represented an increase of over 20 thousand percent compared

with 17,422 tonnes in 2013. During the same period, China's imports from Malaysia surged from just 12,685 tonnes in 2013 to 3.67 million tonnes in 2014 which accounted about 99.7% of the total exports.

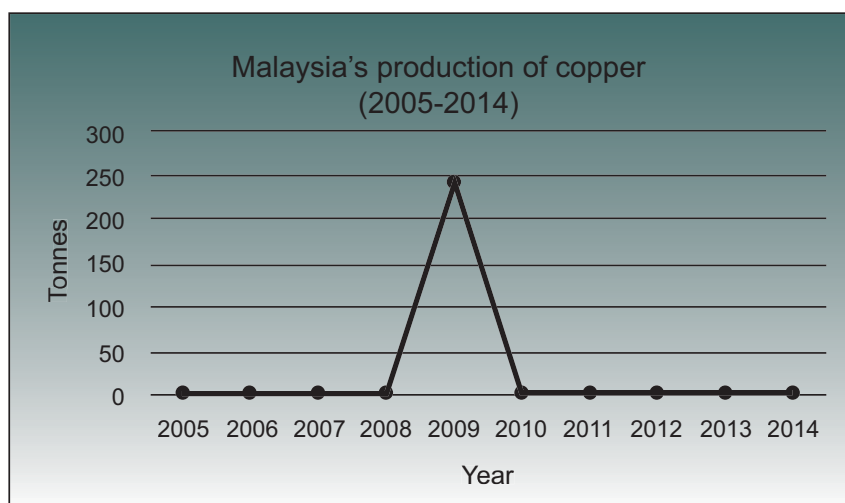
Currently, there are two aluminium smelters plants set- up in Sarawak. The plants owned and operated by Press Metal Smelter and have been in operation since November 2009. The first aluminium smelter in Balingian in Mukah Division which is currently operating at its full capacity of 120,000 tonnes per annum. The Press Metal's second aluminium smelter plant is located in Samalaju Industrial Park with a larger production capacity of 240,000 tonnes per year. The combined capacity of these two plants would be 360,000 tonnes per annum. The smelting plants which produce aluminium ingots and billets use alumina as the raw material that shipped over from Australia.

In Malaysia, the known deposits or resources of bauxite are found mainly in Pahang (Rompin, Ladang Jeram, Bukit Goh and Gebeng), Johor (Pengerang – Teluk Ramunia and Batu Pahat), Terengganu (Jabor Valley), Sarawak (Bukit Gebong, Tanjung Serabang and Munggu Belian in Sematan – Lundu), and Sabah (Telupid). ■

## COPPER

### Malaysia's historic production of copper-in-concentrates

| Year | Tonnes |
|------|--------|
| 2005 | –      |
| 2006 | –      |
| 2007 | –      |
| 2008 | –      |
| 2009 | 240    |
| 2010 | –      |
| 2011 | –      |
| 2012 | –      |
| 2013 | –      |
| 2014 | –      |



### External Trade

19

#### Exports

| H.S. | Commodity                  | tonnes |         |                   | RM '000   |           |                   |
|------|----------------------------|--------|---------|-------------------|-----------|-----------|-------------------|
|      |                            | 2012   | 2013    | 2014 <sup>P</sup> | 2012      | 2013      | 2014 <sup>P</sup> |
| 2603 | Copper ores & conc.        | 2,066  | 81,447  | 39,034            | 3,613     | 144,060   | 204,181           |
| 7401 | Mattes & cement copper     | 146    | 169     | 46                | 976       | 1,095     | 130               |
| 7402 | Unrefined                  | –      | 6,358   | –                 | –         | 84        | –                 |
| 7403 | Refined (a)                | 1,410  | 266,823 | 98,183            | 32,236    | 6,047,817 | 2,268,533         |
| 7404 | Waste & scrap              | 17,498 | 12,740  | 7,386             | 170,311   | 152,722   | 160,854           |
| 7405 | Master alloys              | –      | 1       | –                 | –         | 7         | –                 |
| 7406 | Powder & flakes            | 22,713 | 20,585  | 35,716            | 309,121   | 244,568   | 371,892           |
| 7407 | Bars, rods & profile (a)   | 30,193 | 43,284  | 41,584            | 736,604   | 802,747   | 907,679           |
| 7408 | Wire (a)                   | 45,196 | 50,671  | 56,213            | 1,035,125 | 1,162,052 | 1,255,782         |
| 7409 | Plates, sheets & strip (a) | 11,275 | 8,854   | 7,543             | 226,303   | 194,189   | 177,825           |
| 7410 | Foil (a)                   | 22,039 | 17,919  | 19,079            | 669,879   | 567,594   | 623,911           |
| 7411 | Tubes & pipes (a)          | 40,917 | 40,290  | 41,365            | 1,137,592 | 1,094,829 | 1,109,336         |
| 7412 | Tubes & pipes fitting (a)  | 243    | 372     | 482               | 5,828     | 11,493    | 14,470            |

## Commodity Review: Copper

### Imports

| H.S. | Commodity                  | tonnes  |         |                   | RM '000   |            |                   |
|------|----------------------------|---------|---------|-------------------|-----------|------------|-------------------|
|      |                            | 2012    | 2013    | 2014 <sup>P</sup> | 2012      | 2013       | 2014 <sup>P</sup> |
| 2603 | Copper ores & conc.        | 175     | 39,224  | 28,204            | 412       | 355,636    | 162,157           |
| 7401 | Mattes & cement copper     | 68      | 714     | 66                | 853       | 18,527     | 2,174             |
| 7402 | Unrefined                  | -       | 149     | 75                | -         | 4696       | 2,240             |
| 7403 | Refined (a)                | 214,607 | 522,612 | 263,223           | 5,338,100 | 12,389,327 | 6,122,878         |
| 7404 | Waste & scrap              | 13,523  | 12,968  | 16,075            | 275,045   | 191,066    | 118,763           |
| 7405 | Master alloys              | 724     | 803     | 553               | 27,103    | 23,882     | 18,239            |
| 7406 | Powder & flakes            | 471     | 499     | 362               | 7,450     | 7,769      | 6,411             |
| 7407 | Bars, rods & profile (a)   | 31,213  | 38,279  | 10,770            | 709,734   | 901,788    | 232,720           |
| 7408 | Wire (a)                   | 47,530  | 54,871  | 56,585            | 1,189,676 | 1,302,305  | 1,326,722         |
| 7409 | Plates, sheets & strip (a) | 34,508  | 36,094  | 37,992            | 1,077,261 | 997,972    | 995,642           |
| 7410 | Foil (a)                   | 18,714  | 17,540  | 18,467            | 496,346   | 499,921    | 529,408           |
| 7411 | Tubes & pipes (a)          | 30,318  | 34,117  | 30,535            | 829,622   | 879,145    | 824,288           |
| 7412 | Tubes & pipes fitting (a)  | 2,975   | 2,972   | 2,815             | 94,561    | 105,634    | 105,113           |

Note(s): (a) = including alloys

Source: Department of Statistics

### Malaysia's exports of copper ores and concentrates, by country

| Country   | 2012              |                  | 2013              |                    | 2014 <sup>P</sup> |                    |
|---|-------------------|------------------|-------------------|--------------------|-------------------|--------------------|
|   | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)         | Quantity (tonnes) | Value (RM)         |
| <i>Copper ores &amp; concentrates (HS: 2603.00.000)</i> |                   |                  |                   |                    |                   |                    |
| China   | 286               | 714,350          | 81,447            | 144,059,735        | 38,454            | 202,734,136        |
| Thailand  | -                 | -                | -                 | -                  | 580               | 1,446,878          |
| Other   | 1,781             | 2,899,000        | -                 | -                  | -                 | -                  |
| <b>Total</b>  | <b>2,066</b>      | <b>3,613,350</b> | <b>81,447</b>     | <b>144,059,735</b> | <b>39,034</b>     | <b>204,181,014</b> |

## Malaysia's imports of copper ores and concentrates, by country

| Country   | 2012              |                | 2013              |                    | 2014 <sup>p</sup> |                    |
|---|-------------------|----------------|-------------------|--------------------|-------------------|--------------------|
|   | Quantity (tonnes) | Value (RM)     | Quantity (tonnes) | Value (RM)         | Quantity (tonnes) | Value (RM)         |
| <i>Copper ores &amp; concentrates (HS: 2603.00.000)</i> |                   |                |                   |                    |                   |                    |
| Peru  | –                 | –              | –                 | –                  | 10,288            | 111,701            |
| Chile   | –                 | –              | –                 | –                  | 12,231            | 93,452             |
| Canada  | –                 | –              | –                 | –                  | 7,741             | 57,891             |
| Switzerland   | –                 | –              | –                 | –                  | 4,623             | 41,741             |
| Spain   | –                 | –              | –                 | –                  | 1,543             | 36,037             |
| Others  | 175               | 412,510        | 4,342             | 50,851,584         | 3,070             | 18,648,521         |
| <b>Total</b>  | <b>175</b>        | <b>412,510</b> | <b>39,224</b>     | <b>355,636,436</b> | <b>28,205</b>     | <b>162,157,384</b> |

Source: Department of Statistics

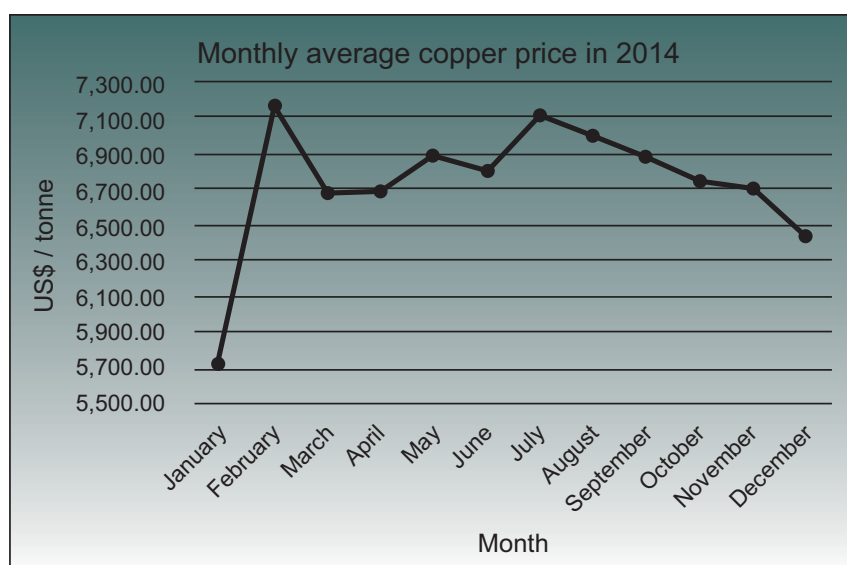
## Price

21

## Average monthly copper price in 2014

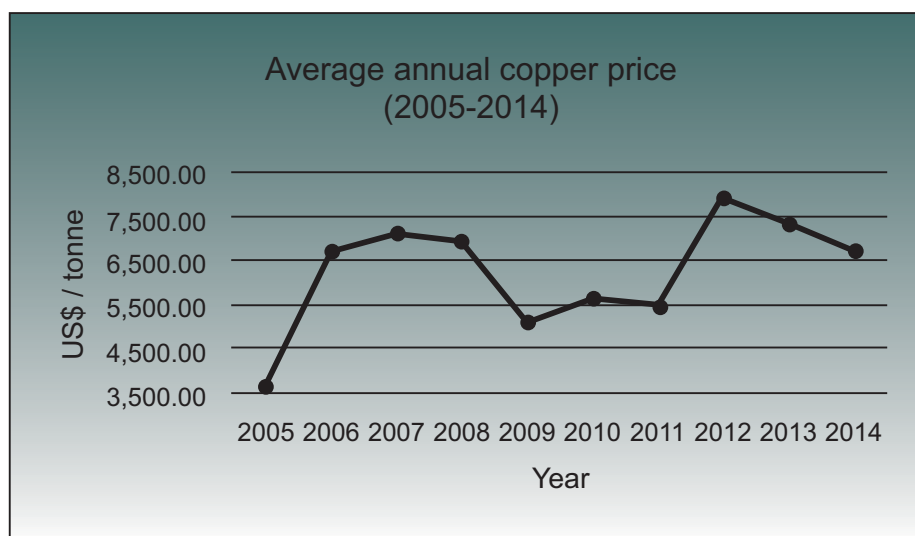
| 2014              | US\$/tonne      |
|-------------------|-----------------|
| January           | 5,733.71        |
| February          | 7,158.31        |
| March             | 6,667.81        |
| April             | 6,675.33        |
| May               | 6,883.88        |
| June              | 6,795.43        |
| July              | 7,104.50        |
| August            | 6,998.30        |
| September         | 6,872.23        |
| October           | 6,739.20        |
| November          | 6,697.83        |
| December          | 6,422.95        |
| <b>Annual Avg</b> | <b>6,729.12</b> |

Source: UNCTAD



### Average annual copper price (2005 - 2014)

| Year | US\$/<br>tonne  |
|------|-----------------|
| 2005 | 3,678.13        |
| 2006 | 6,720.80        |
| 2007 | 7,117.25        |
| 2008 | 6,955.01        |
| 2009 | 5,127.25        |
| 2010 | 5,646.54        |
| 2011 | 5,496.48        |
| 2012 | 7,949.43        |
| 2013 | 7,325.63        |
| 2014 | <b>6,729.12</b> |



London Metal Exchange,  
Grade A, Cash

Source: UNCTAD

### World mine production of copper 2012 - 2014

22

| Country                      | tonnes '000(metal content) |               |                   | % of<br>2014 <sup>P</sup> |
|------------------------------|----------------------------|---------------|-------------------|---------------------------|
|                              | 2012                       | 2013          | 2014 <sup>P</sup> |                           |
| Chile                        | 5,430                      | 5,780         | 5,800             | 30.97                     |
| China                        | 1,630                      | 1,600         | 1,620             | 8.65                      |
| Peru                         | 1,300                      | 1,380         | 1,400             | 7.48                      |
| United States of America     | 1,170                      | 1,250         | 1,370             | 7.32                      |
| Australia                    | 958                        | 990           | 1,000             | 5.34                      |
| Russia                       | 883                        | 933           | 850               | 4.54                      |
| Congo(Kinshasa)              | 600                        | 970           | 1,100             | 5.87                      |
| Zambia                       | 690                        | 760           | 730               | 3.90                      |
| Canada                       | 579                        | 632           | 680               | 3.63                      |
| Mexico                       | 440                        | 480           | 520               | 2.78                      |
| Kazakhstan                   | 424                        | 446           | 430               | 2.30                      |
| Poland                       | 427                        | 429           | 425               | 2.27                      |
| Indonesia                    | 360                        | 504           | 400               | 2.14                      |
| Other countries              | 2,000                      | 2,200         | 2,400             | 12.82                     |
| <b>World total (rounded)</b> | <b>16,900</b>              | <b>18,254</b> | <b>18,725</b>     |                           |

Source: United States Geological Survey



## Review

There was no copper production in Malaysia after the last copper production in 2009 from the Mengapur copper mine in Pahang.

A Canadian-based company Monument Mining Limited continued the evaluation work on the Mengapur polymetallic Cu-Au-Ag-S (Fe-Mo) deposit located in the Central Belt area of Peninsular Malaysia. During the year, the company completed an extensive metallurgical work at the company's in-house R&D laboratory to support the design and construction of the iron/copper beneficiation plant. During the fourth quarter 2014, construction of an iron oxide beneficiation plant was initiated and designed to separate iron from copper and other metals in the top soil and fresh rock at the Mengapur site. However, in light of the sharp decline in iron price and the continued slide of copper price, the start-up and pending production has been put on hold and the company is re-evaluating the production alternatives and has initiated studies on copper production.

The other prospective areas in this country are found mainly in East Malaysia. In Sabah, copper resources occur in Tampang, Bidu-Bidu Hills,

Kiabau, Pinanduan, Karang, Gunung Nungkok and Bambang. In Sarawak, areas with copper potential have been identified in Bukit Jebong - Biawak, Kendai, Bau, Gunung Buri, Bukit Subong - Bukit Pan and Bukit Nimong.

Malaysia relied on imported copper metal and products to meet the demand for local industry. In 2014, Malaysia imported 263,223 tonnes of refined copper and copper alloys and 16,075 tonnes of copper scrap valued at RM6.24 billion. During the year, Malaysia exported 98,183 tonnes of refined copper and copper alloys and 7,386 tonnes of copper scrap with a total value of RM2.43 billion.

In 2014, Malaysia continued to be an importer of copper ores and concentrates mainly from Canada, Chile, Switzerland, Peru and Oman. The total imports were 28,205 tonnes worth RM162.16 million decreased from 39,224 tonnes in the previous year. Malaysia exported 39,034 tonnes of copper ores and concentrates valued at RM204.18 million in 2014 compared to 81,447 tonnes valued at RM144.06 million during 2013. ■

## GOLD

### Malaysia's production of gold 2011- 2014

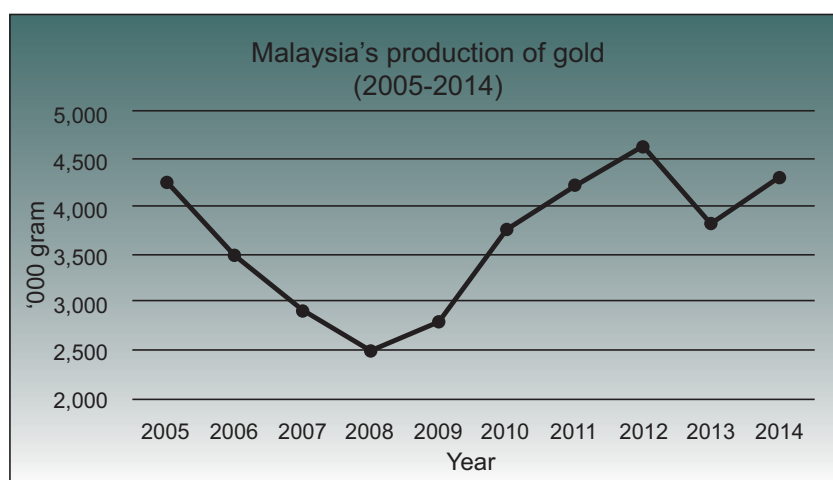
| State        | 2011             |           | 2012             |           | 2013             |           | 2014             |           |
|--------------|------------------|-----------|------------------|-----------|------------------|-----------|------------------|-----------|
|              | grams            | mines     | grams            | mines     | grams            | mines     | grams            | mines     |
| Pahang       | 4,010,294        | 10        | 4,347,473        | 10        | 3,220,424        | 7         | 3,278,757        | 7         |
| Kelantan     | 183,440          | 4         | 265,090          | 6         | 559,065          | 8         | 1,027,767        | 5         |
| Terengganu   | 25,590           | 3         | 12,424           | 1         | 43,219           | 3         | 1,805            | 2         |
| <b>Total</b> | <b>4,219,324</b> | <b>17</b> | <b>4,624,987</b> | <b>17</b> | <b>3,822,708</b> | <b>18</b> | <b>4,308,329</b> | <b>14</b> |

Note(s): mines = indicates maximum number of mines operating during the year

### Malaysia's historic production of gold

24

| Year | '000 g |
|------|--------|
| 2005 | 4,249  |
| 2006 | 3,497  |
| 2007 | 2,913  |
| 2008 | 2,490  |
| 2009 | 2,794  |
| 2010 | 3,765  |
| 2011 | 4,219  |
| 2012 | 4,625  |
| 2013 | 3,823  |
| 2014 | 4,308  |



## External Trade

### Exports

| H.S.        | Commodity             | kg    |           |                   | RM '000 |         |                   |
|-------------|-----------------------|-------|-----------|-------------------|---------|---------|-------------------|
|             |                       | 2012  | 2013      | 2014 <sup>P</sup> | 2012    | 2013    | 2014 <sup>P</sup> |
| 2616.90.100 | Ores & concentrates   | –     | 8,975,283 | 9,248,876         | –       | 122,296 | 164,560           |
| 7108.11.000 | Powder                | 86    | –         | –                 | 13,720  | –       | –                 |
| 7108.12.000 | Unwrought (a)         | 5,337 | 5,337     | 5,690             | 748,943 | 641,900 | 702,287           |
| 7108.13.000 | Semi-manufactures (a) | 1,933 | 1,201     | 1,818             | 284,069 | 155,399 | 226,924           |
| 7109.00.000 | Rolled gold unworked  | 145   | 47        | 42                | 1,502   | 2,479   | 877               |
| 7112.10.000 | Waste and scrap       | –     | –         | –                 | –       | –       | –                 |

### Imports

| H.S.        | Commodity             | kg     |            |                   | RM '000   |           |                   |
|-------------|-----------------------|--------|------------|-------------------|-----------|-----------|-------------------|
|             |                       | 2012   | 2013       | 2014 <sup>P</sup> | 2012      | 2013      | 2014 <sup>P</sup> |
| 2616.90.100 | Ores & concentrates   | 1,360  | 19,975,468 | 2,280,117         | 7         | 330,165   | 26,711            |
| 7108.11.000 | Powder                | 17     | 4          | 8                 | 1,707     | 588       | 1,017             |
| 7108.12.000 | Unwrought (a)         | 11,986 | 55,373     | 72,494            | 1,873,690 | 7,536,106 | 9,508,821         |
| 7108.13.000 | Semi-manufactures (a) | 30,567 | 22,656     | 7,656             | 4,744,109 | 4,744,109 | 986,084           |
| 7109.00.000 | Rolled gold unworked  | 155    | 64         | 356               | 2,495     | 2,495     | 7,311             |
| 7112.10.000 | Waste and scrap       | 10,481 | –          | –                 | 852,151   | –         | –                 |

Note(s): (a) = including alloys

Source: Department of Statistics

## Malaysia's exports of gold (monetary &amp; non-monetary), by country

| Country                              | 2012          |                      | 2013          |                      | 2014 <sup>P</sup> |                       |
|--------------------------------------|---------------|----------------------|---------------|----------------------|-------------------|-----------------------|
|                                      | Quantity (kg) | Value (RM)           | Quantity (kg) | Value (RM)           | Quantity (kg)     | Value (RM)            |
| <i>Gold, Non-Monetary (HS: 7108)</i> |               |                      |               |                      |                   |                       |
| UAE                                  | 402           | 44,522,436           | 331           | 46,190,000           | 30,962            | 4,059,396,398         |
| Switzerland                          | 2,629         | 424,763,059          | 842           | 113,216,000          | 28,108            | 3,719,757,565         |
| Singapore                            | 2,733         | 396,293,610          | 12,678        | 244,977,000          | 17,507            | 2,264,390,785         |
| Hong Kong                            | 1,025         | 135,589,228          | 645           | 82,223,000           | 2,167             | 281,651,369           |
| Australia                            | 4,912         | 684,291,255          | 3,816         | 454,445,000          | 14                | 789,494               |
| Others                               | 1,932         | 192,079,900          | 2,112         | 161,059,000          | 1,400             | 169,935,999           |
| <b>Total</b>                         | <b>13,633</b> | <b>1,877,539,488</b> | <b>20,424</b> | <b>1,102,110,000</b> | <b>80,158</b>     | <b>10,495,921,610</b> |

## Malaysia's imports of gold (monetary &amp; non-monetary), by country

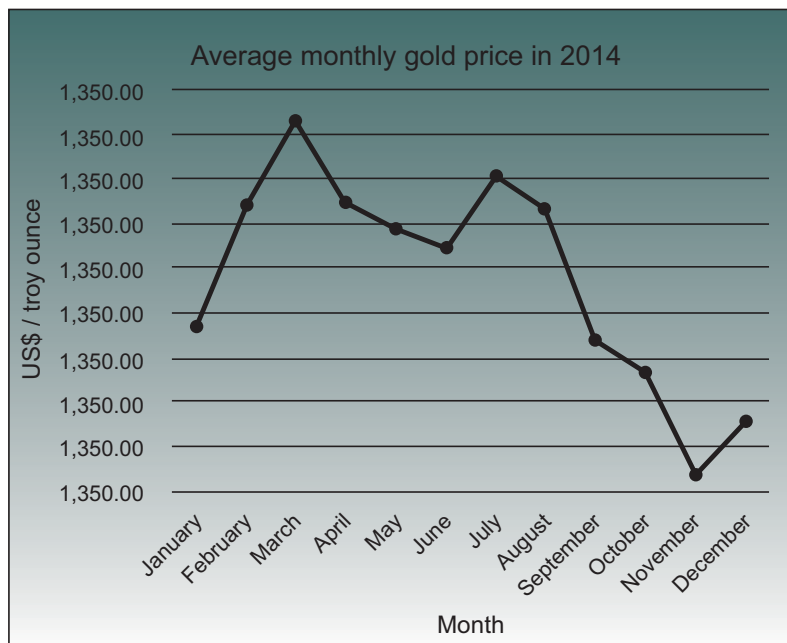
| Country                              | 2012          |                      | 2013          |                       | 2014 <sup>P</sup> |                       |
|--------------------------------------|---------------|----------------------|---------------|-----------------------|-------------------|-----------------------|
|                                      | Quantity (kg) | Value (RM)           | Quantity (kg) | Value (RM)            | Quantity (kg)     | Value (RM)            |
| <i>Gold, Non-Monetary (HS: 7108)</i> |               |                      |               |                       |                   |                       |
| UAE                                  | 30,908        | 4,316,428,000        | 35,728        | 5,104,067,000         | 32,685            | 4,690,528,745         |
| Singapore                            | 17,768        | 2,594,846,000        | 23,892        | 3,150,501,000         | 21,768            | 2,964,923,687         |
| Switzerland                          | 9,665         | 1,499,557,000        | 21,380        | 2,771,844,000         | 20,861            | 2,771,675,258         |
| Hong Kong                            | 4,080         | 672,926,000          | 2,185         | 294,583,000           | 2,174             | 294,570,798           |
| USA                                  | 277           | 18,655,000           | 174           | 19,288,000            | 170               | 19,185,486            |
| Others                               | 1,065         | 94,416,000           | 1,096         | 60,932,000            | 377               | 56,601,782            |
| <b>Total</b>                         | <b>63,763</b> | <b>9,196,828,000</b> | <b>84,455</b> | <b>11,401,215,000</b> | <b>78,035</b>     | <b>10,797,485,756</b> |

Source: Department of Statistics

**Price**

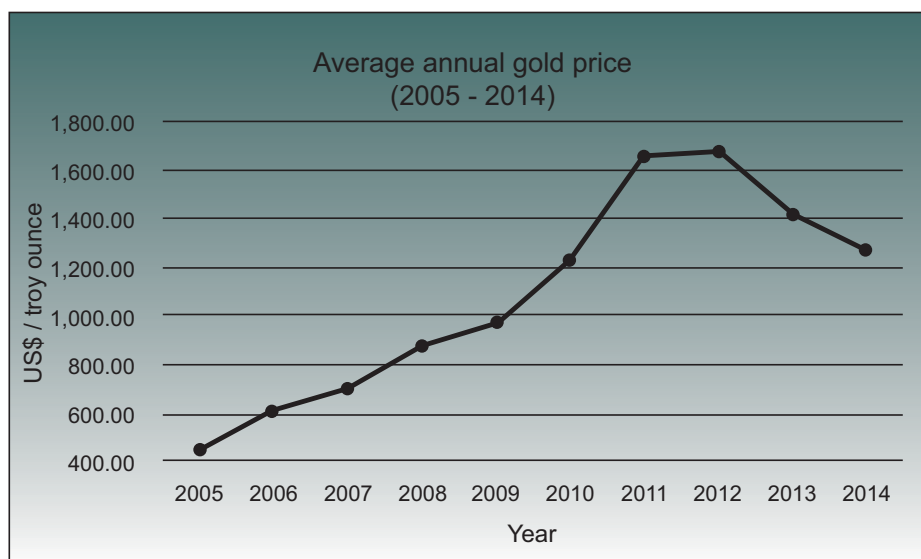
**Average monthly gold price in 2014**

| 2014              | US\$/troy ounce |
|-------------------|-----------------|
| January           | 1,243.86        |
| February          | 1,297.83        |
| March             | 1,336.08        |
| April             | 1,299.01        |
| May               | 1,287.56        |
| June              | 1,279.10        |
| July              | 1,310.97        |
| August            | 1,295.99        |
| September         | 1,237.51        |
| October           | 1,222.49        |
| November          | 1,176.35        |
| December          | 1,200.94        |
| <b>Annual Avg</b> | <b>1,243.86</b> |



**Average annual gold price (2005 - 2014)**

| Year | US\$/troy ounce |
|------|-----------------|
| 2005 | 444.88          |
| 2006 | 604.39          |
| 2007 | 696.70          |
| 2008 | 871.71          |
| 2009 | 973.00          |
| 2010 | 1,227.34        |
| 2011 | 1,652.31        |
| 2012 | 1,668.82        |
| 2013 | 1,411.03        |
| 2014 | 1,265.64        |



London, 99.5% fine, Afternoon Fixing

Source: UNCTAD

## World mine production of gold

| Country                      | kilograms (metal content) |                  |                   | % of 2014 <sup>P</sup> |
|------------------------------|---------------------------|------------------|-------------------|------------------------|
|                              | 2012                      | 2013             | 2014 <sup>P</sup> |                        |
| China                        | 403,000                   | 430,000          | 450,000           | 15.73                  |
| Australia                    | 250,000                   | 265,000          | 270,000           | 9.44                   |
| USA                          | 235,000                   | 230,000          | 211,000           | 7.38                   |
| Russia                       | 218,000                   | 230,000          | 245,000           | 8.57                   |
| Peru                         | 161,000                   | 151,000          | 150,000           | 5.24                   |
| South Africa                 | 160,000                   | 160,000          | 150,000           | 5.24                   |
| Canada                       | 104,000                   | 124,000          | 160,000           | 5.59                   |
| Indonesia                    | 59,000                    | 61,000           | 65,000            | 2.27                   |
| Other countries              | 1,100,000                 | 1,149,000        | 1,159,000         | 40.52                  |
| <b>World total (rounded)</b> | <b>2,690,000</b>          | <b>2,800,000</b> | <b>2,860,000</b>  |                        |

Source: United States Geological Survey

## Review

During 2014, there were a total of 14 gold mines operating in the country which located in the states of Pahang, Kelantan and Terengganu.

Malaysia's total gold production during the year increased by 12.69% from 3,823 kg in 2013 to 4,308 kg in 2014. The average gold price in 2014 was at US\$1,265.64 per troy ounce which decreased from US\$1,411.03 per troy ounce recorded in the previous year. Average gold price continued to decrease in 2014 after peaking in the year 2012.

In 2014, the Malaysia gold production mainly comes from the state of Pahang which contributed about 76.1% (3,279 kg) of the total gold produced in the country in which the production increased 1.83% from 3,220 kg in 2013. During the year, there were seven gold mines operating in Pahang the same number as in the previous year. The major gold mines operating in Pahang are Selinsing Gold Mine in Sungai Kermoi, Penjom Gold Mine in Penjom and Raub Australian Gold Mine in Bukit Koman.

Most of the gold produced in Malaysia comes from the Selinsing Gold Mine and Penjom Gold Mine. Selinsing Gold Mine is owned by Monument Mining Limited which is an established Canadian gold producer, with production cash costs among the lowest in the world. In 2014, explorations at Selinsing tenement areas were focused on the collation and interpretation of all geological, geochemical and geophysical data, mapping geological structures, updating the resource

estimate and block model, and drilling additional oxide targets. At Selinsing, the drill hole assay results confirm that gold mineralization extends below the existing pit design and continues at depth.

Besra, a leading gold producer in Vietnam has carried out a feasibility study for Stage 1 of the Bau Gold Project in Sarawak. Bau is a historic goldfield which has been intermittently mined at surface for the past 150 years. The Carlin-style gold deposits occurring in the Bau mining district has to-date produced over three million ounces of gold. Since 2006, Besra has been consolidating mining tenure over approximately 350 km<sup>2</sup> of the most prospective parts of the goldfield and systematically exploring multiple gold deposits and prospective zones. The resource update at Jugan and Young's Hill gold deposits by Besra shows total proven and probable reserves at 10.66 million tonnes at a grade of 1.70 g/t Au. Feasibility study conducted in the previous year indicates that production may reach more than 100,000 ounces per annum.

The Minerals and Geoscience Department has been undertaking gold exploration activities. Gold potential areas have been delineated in Sungai Malati, Kunak in Sabah and Gunung Nyendeng in Sarawak. In 2014, gold exploration activities were carried out in Kelantan, Pahang, Terengganu, Sabah and Sarawak. Areas with anomalous gold were identified at Kuala Betis, Gua Musang in Kelantan, at Sungai Kerak, Lipis in Pahang and Gunung Andrassy in Tawau, Sabah. ■

## IRON

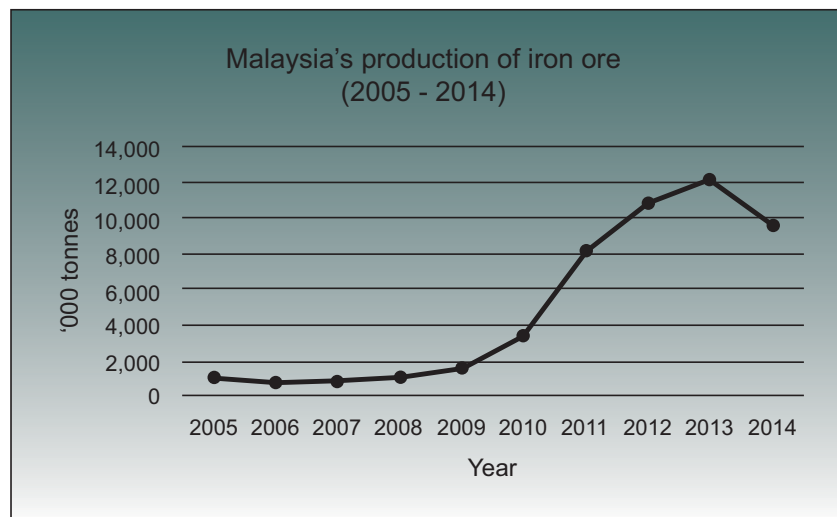
### Malaysia's production of iron ore

| State         | 2011             |           | 2012              |            | 2013              |            | 2014             |            |
|---------------|------------------|-----------|-------------------|------------|-------------------|------------|------------------|------------|
|               | tonnes           | mines     | tonnes            | mines      | tonnes            | mines      | tonnes           | mines      |
| Pahang        | 5,792,313        | 44        | 6,968,755         | 54         | 8,448,693         | 52         | 6,592,609        | 61         |
| Kelantan      | 548,090          | 8         | 1,417,249         | 12         | 1,122,087         | 18         | 526,927          | 19         |
| Terengganu    | 489,244          | 11        | 703,916           | 12         | 939,197           | 13         | 636,751          | 9          |
| Johor         | 902,479          | 10        | 1,113,709         | 10         | 972,418           | 10         | 1,394,403        | 19         |
| Kedah         | 310,112          | 3         | 444,500           | 6          | 603,978           | 9          | 382,333          | 10         |
| Perak         | 17,095           | 2         | 71,710            | 3          | 16,000            | 2          | 0                | 2          |
| Melaka        | 14,900           | 1         | 22,940            | 1          | 10,470            | 1          | 0                | 1          |
| Neg. Sembilan | 3,646            | 1         | 143,243           | 5          | 21,417            | 5          | 82,300           | 3          |
| <b>Total</b>  | <b>8,077,879</b> | <b>80</b> | <b>10,886,022</b> | <b>103</b> | <b>12,134,258</b> | <b>110</b> | <b>9,615,323</b> | <b>124</b> |

mines = indicates highest number of mines operating during the year

### Malaysia's historic production of iron ore

| Year | tonnes     |
|------|------------|
| 2005 | 949,605    |
| 2006 | 667,082    |
| 2007 | 802,030    |
| 2008 | 981,932    |
| 2009 | 1,470,186  |
| 2010 | 3,368,942  |
| 2011 | 8,077,879  |
| 2012 | 10,886,022 |
| 2013 | 12,134,258 |
| 2014 | 9,615,323  |



## External Trade

## Exports

| H.S. | Commodity                 | tonnes    |            |                   | RM '000   |           |                   |
|------|---------------------------|-----------|------------|-------------------|-----------|-----------|-------------------|
|      |                           | 2012      | 2013       | 2014 <sup>P</sup> | 2012      | 2013      | 2014 <sup>P</sup> |
| 2601 | Iron ores & conc.         | 8,930,799 | 12,429,183 | 11,610,202        | 1,827,828 | 1,464,507 | 1,389,691         |
| 7201 | Pig iron                  | 45        | 554        | 1,511             | 536       | 2,892     | 9,205             |
| 7202 | Ferro-alloys              | 7,217     | 3,585      | 7,995             | 61,587    | 40,115    | 34,274            |
| 7203 | Direct reduced & sponge   | 874,066   | 52,715     | 708,076           | 1,093,619 | 585,106   | 815,723           |
| 7204 | Waste & scrap             | 82,096    | 52,579     | 522,175           | 70,401    | 62,718    | 55,174            |
| 7205 | Granules & powders        | 7,996     | 8,493      | 730,867           | 14,508    | 21,636    | 880,432           |
| 7206 | Iron & steel ingots       | 14        | 918        | 126               | 522       | 2,907     | 1,264             |
| 7207 | Semi-finished products    | 583,476   | 134,197    | 94,964            | 1,149,567 | 246,949   | 182,149           |
| 7218 | Stainless steel ingots    | 2,429     | 5,045      | 5,856             | 13,526    | 49,325    | 46,836            |
| 7224 | Other alloys steel ingots | 17,144    | 5,787      | 887               | 112,385   | 40,812    | 8,653             |

## Imports

| H.S. | Commodity                 | tonnes    |           |                   | RM '000   |           |                   |
|------|---------------------------|-----------|-----------|-------------------|-----------|-----------|-------------------|
|      |                           | 2012      | 2013      | 2014 <sup>P</sup> | 2012      | 2013      | 2014 <sup>P</sup> |
| 2601 | Iron ores & conc.         | 3,290,933 | 1,863,486 | 3,813,980         | 1,827,828 | 1,086,669 | 1,590,094         |
| 7201 | Pig iron                  | 58,366    | 160,032   | 61,618            | 90,378    | 199,952   | 86,268            |
| 7202 | Ferro-alloys              | 62,219    | 63,849    | 58,077            | 343,672   | 324,316   | 292,452           |
| 7203 | Direct reduced & sponge   | 34,918    | 59,890    | 46,411            | 38,001    | 91,099    | 80,772            |
| 7204 | Waste & scrap             | 1,816,176 | 1,927,998 | 961,438           | 2,558,246 | 2,425,889 | 1,237,910         |
| 7205 | Granules & powders        | 31,336    | 31,718    | 68,718            | 55,086    | 87,523    | 100,214           |
| 7206 | Iron & steel ingots       | 683       | 339       | 402               | 3,394     | 5,406     | 2,931             |
| 7207 | Semi-finished products    | 184,426   | 134,919   | 172,990           | 383,112   | 226,809   | 356,474           |
| 7218 | Stainless steel ingots    | 3,969     | 5,335     | 5,275             | 58,645    | 64,638    | 52,290            |
| 7224 | Other alloys steel ingots | 62,050    | 1,300     | 8,625             | 199,605   | 8,376     | 33,967            |

Source: Department of Statistics



## Malaysia's exports of iron ore, by country

| Country                                     | 2012              |                      | 2013              |                      | 2014 <sup>P</sup> |                      |
|---|-------------------|----------------------|-------------------|----------------------|-------------------|----------------------|
|   | Quantity (tonnes) | Value (RM)           | Quantity (tonnes) | Value (RM)           | Quantity (tonnes) | Value (RM)           |
| <i>Iron ores &amp; conc.<br/>(HS: 2601)</i> |                   |                      |                   |                      |                   |                      |
| China                                       | 8,930,715         | 1,082,790,743        | 12,277,700        | 1,438,900,078        | 11,068,874        | 1,310,360,892        |
| India                                       | –                 | –                    | –                 | –                    | 474,921           | 65,288,237           |
| Hong Kong                                   | 33                | 6,000                | 17,678            | 6,879,017            | 50,401            | 11,941,858           |
| Singapore                                   | 9                 | 21,300               | 16,100            | 1,915,836            | 16,000            | 2,087,040            |
| ROK   | –                 | –                    | –                 | –                    | 6                 | 13,066               |
| Others                                      | 41                | 17,484               | 117,706           | 16,812,057           | –                 | –                    |
| <b>Total</b>                                | <b>8,930,799</b>  | <b>1,082,835,527</b> | <b>12,429,184</b> | <b>1,464,506,988</b> | <b>11,610,202</b> | <b>1,389,691,093</b> |

## Malaysia's imports of iron ore, by country

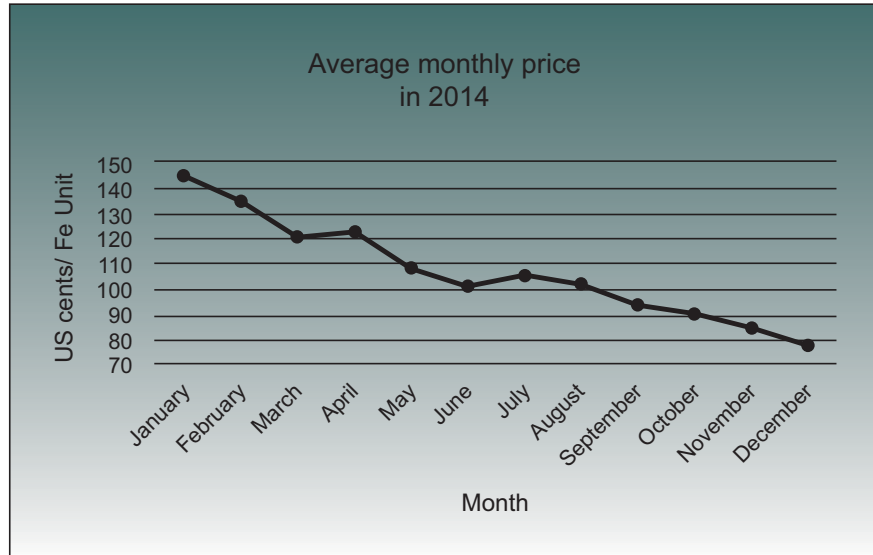
| Country                                     | 2012              |                      | 2013              |                      | 2014 <sup>P</sup> |                      |
|---|-------------------|----------------------|-------------------|----------------------|-------------------|----------------------|
|   | Quantity (tonnes) | Value (RM)           | Quantity (tonnes) | Value (RM)           | Quantity (tonnes) | Value (RM)           |
| <i>Iron ores &amp; conc.<br/>(HS: 2601)</i> |                   |                      |                   |                      |                   |                      |
| Brazil                                      | 2,760,822         | 1,494,066,000        | 1,859,066         | 1,083,283,302        | 3,336,179         | 1,349,352,451        |
| South Africa                                | –                 | –                    | –                 | –                    | 200,001           | 77,677,447           |
| Oman  | –                 | –                    | –                 | –                    | 110,305           | 66,574,650           |
| Chile                                       | –                 | –                    | –                 | –                    | 91,372            | 62,275,504           |
| Japan                                       | 15                | 168,085              | 71                | 606,938              | 45,672            | 17,750,940           |
| Others                                      | 530,096           | 333,593,985          | 4,348             | 2,778,885            | 30,451            | 16,462,571           |
| <b>Total</b>                                | <b>3,290,933</b>  | <b>1,827,827,989</b> | <b>1,863,485</b>  | <b>1,086,669,125</b> | <b>3,813,980</b>  | <b>1,590,093,563</b> |

Source: Department of Statistics

**Price**

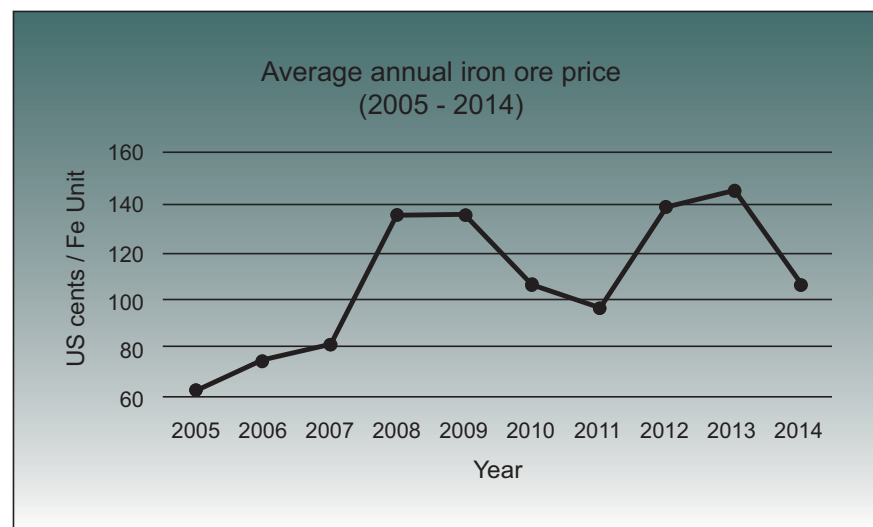
**Average monthly price in 2014**

| 2014              | US cents/<br>Fe Unit |
|-------------------|----------------------|
| January           | 145                  |
| February          | 134                  |
| March             | 120                  |
| April             | 122                  |
| May               | 107                  |
| June              | 100                  |
| July              | 104                  |
| August            | 101                  |
| September         | 92                   |
| October           | 89                   |
| November          | 83                   |
| December          | 76                   |
| <b>Annual Avg</b> | <b>106</b>           |



**Average annual iron ore price (2005 - 2014)**

| Year | US cents/<br>Fe Unit |
|------|----------------------|
| 2005 | 62.51                |
| 2006 | 74.39                |
| 2007 | 81.46                |
| 2008 | 134.41               |
| 2009 | 134.41               |
| 2010 | 105.90               |
| 2011 | 96.50                |
| 2012 | 138.10               |
| 2013 | 144.80               |
| 2014 | <b>106.08</b>        |



Brazilian to Europe  
C. 65% Fe F.O.B

Note:

Price is reported in cents, U.S. currency, for each percentage point of iron in a tonne of ore, e.g., at 74.39¢/Fe unit, ore grading 64.5% iron would bear a price of 74.39¢ x 64.5 = US\$47.98/t.

Source: UNCTAD

## World mine production of iron ore

| Country                      | tonnes               |                      |                      | % of 2014 <sup>p</sup> |
|------------------------------|----------------------|----------------------|----------------------|------------------------|
|                              | 2012                 | 2013                 | 2014 <sup>p</sup>    |                        |
| China                        | 1,310,000,000        | 1,450,000,000        | 1,500,000,000        | 46.58                  |
| Australia                    | 521,000,000          | 609,000,000          | 660,000,000          | 20.50                  |
| Brazil                       | 398,000,000          | 317,000,000          | 320,000,000          | 9.94                   |
| India                        | 144,000,000          | 150,000,000          | 150,000,000          | 4.66                   |
| Russia                       | 105,000,000          | 105,000,000          | 105,000,000          | 3.26                   |
| Ukraine                      | 82,000,000           | 82,000,000           | 82,000,000           | 2.55                   |
| South Africa                 | 63,000,000           | 72,000,000           | 78,000,000           | 2.42                   |
| United States of America     | 54,000,000           | 53,000,000           | 58,000,000           | 1.80                   |
| Canada                       | 39,000,000           | 43,000,000           | 41,000,000           | 1.27                   |
| Sweden                       | 23,000,000           | 26,000,000           | 26,000,000           | 20.99                  |
| Other countries              | 186,000,000          | 180,000,000          | 200,000,000          | 6.21                   |
| <b>World total (rounded)</b> | <b>2,925,000,000</b> | <b>3,110,000,000</b> | <b>3,220,000,000</b> |                        |

Source: United States Geological Survey

## Review

For the past ten years since 2005, iron ore production in Malaysia has experienced unprecedented growth with the nation's annual growth rate of 26.1%, mainly driven by substantial import from China. Iron ore production value in the year 2014 accounted for 42.9% of the total value of the nation's mineral production which topped all other major minerals in Malaysia. The industry was the largest individual mineral commodity sector in Malaysia by value and plays a pivotal role in the State's economy. However, the production in 2014 has plummeted 20.8% to 9,615,323 tonnes valued at RM2,252.87 million from 12,134,258 tonnes valued at RM1,689.80 million in 2013 due to slowing demand from China.

Iron ore production came from 124 mines operating in Pahang (61), Johor (19), Kelantan (19), Kedah (10), Terengganu (9), Negeri Sembilan (3), Perak (2) and Melaka (1). The bulk of iron ore production in Malaysia comes from the state of Pahang, where Maran, Kuantan, and Rompin districts produced about 68.6% of total country's production. Most of the iron-ore mined were of low grade from mines with small reserves. The types of iron ore commonly produced in Malaysia are magnetite, hematite, and ferromanganese.

In 2014, a total of 11.6 million tonnes of iron ore valued at RM1,389.6 million were exported. This

was a decrease of 6.5% compared with 12.4 million tonnes valued at RM1,464.5 million exported in 2013. The bulk of the ore went to China which accounted about 95.3% of total export in 2014. The remaining ore are consumed by local industry mainly in the making of pipe coating, cement industry, and iron and steel plants.

During the same year, Malaysia imported 3.8 million tonnes of iron ore valued at RM1,590.1 million which was mainly from Brazil compared with 1.86 million tonnes valued at RM1,086.7 million in 2013. The Malaysian steel industries imported their iron ore requirements in the form of lumps, pellets and scraps as the main feed material.

Currently, potential areas for iron ore are in Pahang (Luit, Bukit Ibam, Sg. Temau, Ulu Rompin and Tasik Chini), Terengganu (Bukit Besi and Machang Setahun), Johor (Chaah Baru, Bukit Medan, Bukit Kepong, Jemaluang and Pelepah Kanan), Kedah (Kg. Merbok and Gunung Jerai), Kelantan (Bukit Kuang and Temangan) and Perak (Gunung Panjang, Sg. Choh and Slim River). In Sabah, limonite and lateritic clay containing iron and a small percentage of nickel form residual deposits over the ultrabasic masses. The largest known limonite deposit of this type underlies the Tavai Plateau in the Telupid area. ■

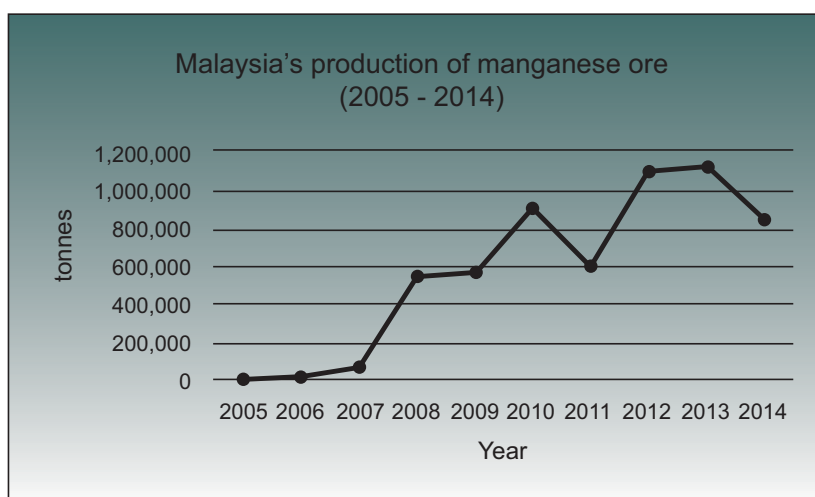
## MANGANESE

### Malaysia's production of manganese ore

| State        | 2011           |           | 2012             |           | 2013             |           | 2014           |           |
|--------------|----------------|-----------|------------------|-----------|------------------|-----------|----------------|-----------|
|              | tonnes         | mines     | tonnes           | mines     | tonnes           | mines     | tonnes         | mines     |
| Kelantan     | 488,195        | 8         | 789,857          | 9         | 846,255          | 10        | 679,429        | 12        |
| Pahang       | 109,722        | 5         | 309,728          | 8         | 278,872          | 8         | 156,000        | 8         |
| <b>Total</b> | <b>597,917</b> | <b>13</b> | <b>1,099,585</b> | <b>17</b> | <b>1,125,127</b> | <b>18</b> | <b>835,429</b> | <b>20</b> |

### Malaysia's historic production of manganese ore

| Year | tonnes    |
|------|-----------|
| 2005 | –         |
| 2006 | 6,500     |
| 2007 | 56,500    |
| 2008 | 536,675   |
| 2009 | 567,963   |
| 2010 | 899,703   |
| 2011 | 597,917   |
| 2012 | 1,099,585 |
| 2013 | 1,125,127 |
| 2014 | 835,429   |



34

### External Trade

#### Exports

| H.S.    | Commodity               | tonnes    |           |                   | RM '000 |         |                   |
|---------|-------------------------|-----------|-----------|-------------------|---------|---------|-------------------|
|         |                         | 2012      | 2013      | 2014 <sup>P</sup> | 2012    | 2013    | 2014 <sup>P</sup> |
| 2602.00 | Manganese ores & conc.  | 1,070,499 | 1,110,405 | 920,844           | 141,240 | 174,028 | 133,416           |
| 2820.10 | Manganese dioxide       | 1,695     | 3,832     | 979               | 6,999   | 16,663  | 4,633             |
| 2820.90 | Other manganese dioxide | 68        | 1,053     | 1,625             | 377     | 4,801   | 7,991             |

## Commodity Review: Manganese

### Imports

| H.S.    | Commodity               | tonnes |       |                   | RM '000 |        |                   |
|---------|-------------------------|--------|-------|-------------------|---------|--------|-------------------|
|         |                         | 2012   | 2013  | 2014 <sup>P</sup> | 2012    | 2013   | 2014 <sup>P</sup> |
| 2602.00 | Manganese ores & conc.  | 124    | 50    | 224               | 2,396   | 286    | 1,062             |
| 2820.10 | Manganese dioxide       | 2,757  | 3,654 | 3,422             | 12,396  | 16,864 | 15,003            |
| 2820.90 | Other manganese dioxide | 2,410  | 4,846 | 8,470             | 7,070   | 10,787 | 25,511            |

Source: Department of Statistics

### Malaysia's exports of manganese ore, by country

| Country   | 2012              |                    | 2013              |                    | 2014 <sup>P</sup> |                    |
|---|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|
|   | Quantity (tonnes) | Value (RM)         | Quantity (tonnes) | Value (RM)         | Quantity (tonnes) | Value (RM)         |
| <i>Manganese ore &amp; conc.</i><br>(HS: 2602.00.000) |                   |                    |                   |                    |                   |                    |
| China   | 1,055,639         | 139,341,683        | 1,090,465         | 170,047,978        | 907,443           | 128,916,880        |
| Indonesia   | 8,100             | 1,210,704          | 15,740            | 3,322,940          | 6,300             | 995,671            |
| Vietnam   | 5,600             | 504,000            | –                 | –                  | 7,100             | 3,503,850          |
| Hong Kong   | 1,160             | 183,280            | –                 | –                  | –                 | –                  |
| India   | –                 | –                  | 4,200             | 655,607            | –                 | –                  |
| Others  | –                 | –                  | –                 | –                  | –                 | –                  |
| <b>Total</b>  | <b>1,070,499</b>  | <b>141,239,667</b> | <b>1,110,405</b>  | <b>174,027,525</b> | <b>920,843</b>    | <b>133,416,401</b> |

35

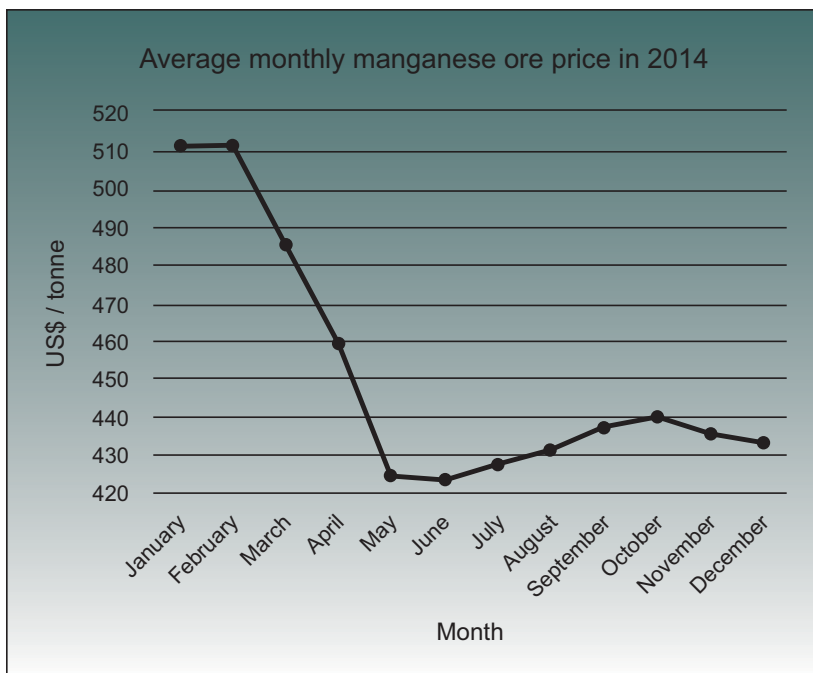
### Malaysia's imports of manganese ore, by country

| Country   | 2012              |                  | 2013              |                | 2014 <sup>P</sup> |                  |
|---|-------------------|------------------|-------------------|----------------|-------------------|------------------|
|   | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)     | Quantity (tonnes) | Value (RM)       |
| <i>Manganese ore &amp; conc.</i><br>(HS: 2602.00.000) |                   |                  |                   |                |                   |                  |
| China   | 37                | 312,641          | 35                | 246,941        | 186               | 599,351          |
| Indonesia   | –                 | –                | 5                 | 7,500          | 17                | 35,024           |
| Singapore   | 36                | 97,286           | 6                 | 11,349         | 11                | 13,800           |
| Turkey  | –                 | –                | –                 | –              | 6                 | 400,000          |
| Others  | 48                | 1,986,568        | 4                 | 20,568         | 4                 | 13,614           |
| <b>Total</b>  | <b>124</b>        | <b>2,396,495</b> | <b>50</b>         | <b>286,358</b> | <b>224</b>        | <b>1,061,789</b> |

**Price**

**Average monthly price in 2014**

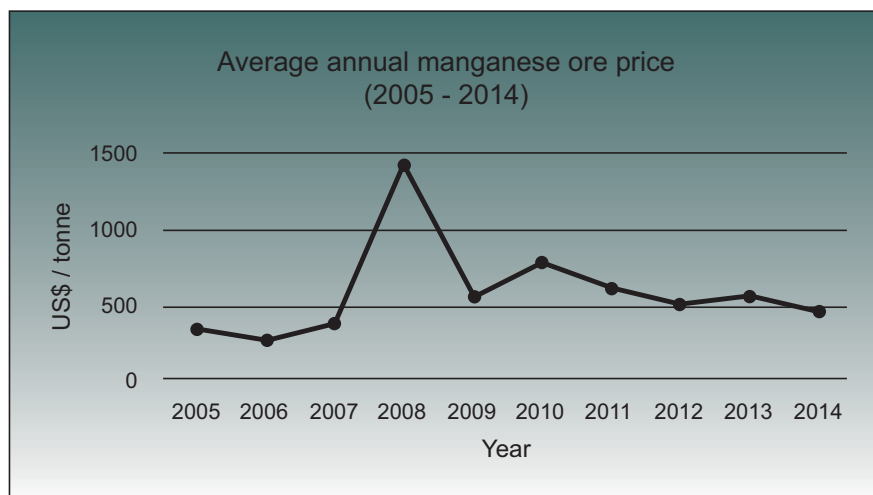
| 2014              | US\$/tonne    |
|-------------------|---------------|
| January           | 511.00        |
| February          | 511.00        |
| March             | 485.00        |
| April             | 459.00        |
| May               | 424.00        |
| June              | 423.00        |
| July              | 427.00        |
| August            | 431.00        |
| September         | 437.00        |
| October           | 440.00        |
| November          | 435.00        |
| December          | 433.00        |
| <b>Annual Avg</b> | <b>451.33</b> |



36

**Average annual manganese ore price (2005 - 2014)**

| Year | US\$/tonne |
|------|------------|
| 2005 | 327.06     |
| 2006 | 259.79     |
| 2007 | 356.94     |
| 2008 | 1,410.49   |
| 2009 | 546.36     |
| 2010 | 771.58     |
| 2011 | 603.33     |
| 2012 | 487.00     |
| 2013 | 541.92     |
| 2014 | 451.33     |



Source: UNCTAD

## World mine production of manganese ore

| Country                      | tonnes            |                   |                   | % of 2014 <sup>P</sup> |
|------------------------------|-------------------|-------------------|-------------------|------------------------|
|                              | 2012              | 2013              | 2014 <sup>P</sup> |                        |
| South Africa                 | 3,600,000         | 4,300,000         | 4,700,000         | 25.86                  |
| Australia                    | 3,080,000         | 2,980,000         | 3,100,000         | 17.06                  |
| China                        | 2,900,000         | 3,000,000         | 3,200,000         | 17.61                  |
| Gabon                        | 1,650,000         | 1,970,000         | 2,000,000         | 11.00                  |
| Brazil                       | 1,330,000         | 1,120,000         | 1,100,000         | 6.05                   |
| India                        | 800,000           | 920,000           | 940,000           | 5.17                   |
| <b>Malaysia*</b>             | <b>1,099,585</b>  | <b>1,125,127</b>  | <b>835,429</b>    | <b>4.60</b>            |
| Ukraine                      | 416,000           | 300,000           | 300,000           | 1.65                   |
| Mexico                       | 188,000           | 212,000           | 220,000           | 1.21                   |
| Other countries              | 1,415,000         | 1,677,000         | <b>1,780,000</b>  | 9.79                   |
| <b>World total (rounded)</b> | <b>16,478,000</b> | <b>17,604,127</b> | <b>18,175,429</b> |                        |

Source: United States Geological Survey

\* Revised figure based on actual production

## Review

Manganese ore is an important raw material in iron and steel production. It is essential by virtue of its sulphur-fixing, deoxidizing and alloying properties. Besides a variety of other uses, manganese is also used in producing aluminium alloys and dry cell batteries.

After a long period of inactivity, manganese mining was revived in 1978 with Kelantan producing 78,329 tonnes of manganese ores. For the period 1980 to 1995, no manganese mining activities were recorded until 1996 when a total of 13,000 tonnes of manganese was produced from Bukit Penchuri, Kelantan. The volume of manganese output from Malaysia depended on price of manganese in the world markets. Since 2005, with an increase in manganese price in the world, Malaysia's manganese output gradually increased during the past several years.

Malaysia's production of manganese ore in 2014 decreased by 25.75% to 835,429 tonnes with a value of RM83.54 million compared with 1,125,127 tonnes valued at RM112.51 million in the previous year. The manganese was produced from 12 operating mines in Kelantan and 8 mines in Pahang. Manganese resources were located in Kelantan, Terengganu, Pahang and Johor with total estimated resources of 3.7 million tonnes with grade mostly less than 50% Mn.

The manganese produced was mainly exported to China. In 2014, Malaysia exported a total of 920,843 tonnes of manganese ore to China and the rest to Indonesia and Vietnam. Export of the mineral ore decreased by

17.12% from 1.11 million tonnes in 2013 to 0.92 million tonnes in 2014. Malaysia also imported small amounts of manganese ore. In 2014, the imports of manganese ore increased compared with 2013. A total of 224 tonnes valued at RM1.06 million of manganese was imported of which 186 tonnes was from China, 17 tonnes from Indonesia and other countries made up the rest.

There are two ferrosilicon and manganese alloys smelters in the country and both are located in Sarawak. The first smelter, Pertama Ferroalloys Sdn. Bhd. was established in 2010 and was the first large-scale manganese alloys and ferrosilicon plant in Malaysia. It is formerly known as AML Manganese (Malaysia) Sdn. Bhd. and is located in the Samalaju Industrial Park in Bintulu, Sarawak. Pertama Ferroalloys Sdn. Bhd. is jointly owned by Asia Minerals Limited, Nippon Denko Company Limited, Chuo Denki Kogyo Co. Ltd., Shinsho Corporation and Carbon Capital Corporation Sdn. Bhd, in which Asia Minerals Limited is the majority shareholder. Construction of the plant was commenced in May 2012 and production was expected to begin in the second quarter of 2015. The target annual production capacity is 250,000 tonnes. The final products of the plant will be manganese alloys, ferrosilicon and electrolytic manganese metal (EMM).

The second smelter, OM Materials (Sarawak) Sdn. Bhd. is a joint venture between OM Holding Groups (80%) and Cahaya Mata Sarawak (20%) to produce ferrosilicon and ferro-manganese intermediate products. The plant is located at Samalaju Industrial Park in Bintulu, Sarawak. The first phase of the smelter project has commenced production in September 2014 and will operate to full commercial production in 2015. Once completed, the ferrosilicon production facility's capacity of 308,000 tonnes per annum will make it as one of the largest and lowest cost ferrosilicon smelters in the world. ■

## RARE EARTH MINERALS

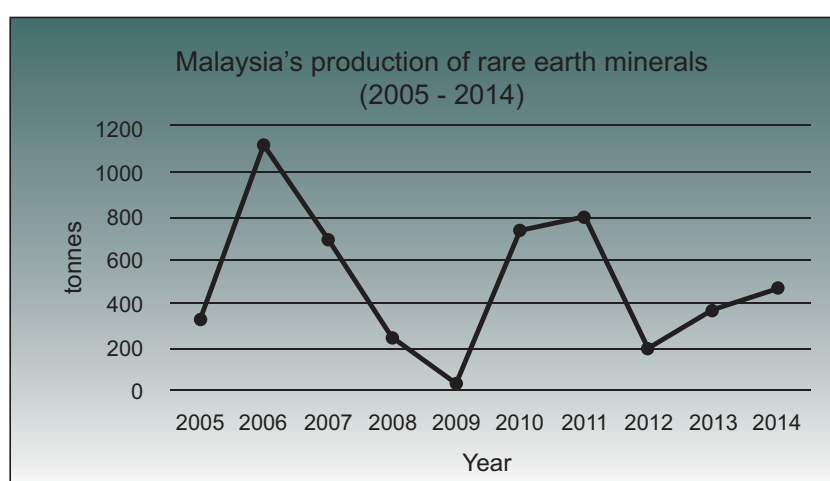
### Malaysia's production of rare earth minerals

| Minerals     | 2011       |          | 2012       |          | 2013       |          | 2014       |          |
|--------------|------------|----------|------------|----------|------------|----------|------------|----------|
|              | tonnes     | mines    | tonnes     | mines    | tonnes     | mines    | tonnes     | mines    |
| Monazite     | 571        | –        | 113        | –        | 261        | –        | 372        | –        |
| Xenotime     | 208        | –        | 66         | –        | 97         | –        | 83         | –        |
| <b>Total</b> | <b>779</b> | <b>–</b> | <b>179</b> | <b>–</b> | <b>358</b> | <b>–</b> | <b>455</b> | <b>–</b> |

Both monazite and xenotime are produce from among processing plant and exist as by-products of tin mining

### Malaysia's historic production of rare earth minerals

| Year | tonnes |
|------|--------|
| 2005 | 320    |
| 2006 | 1,111  |
| 2007 | 682    |
| 2008 | 233    |
| 2009 | 25     |
| 2010 | 732    |
| 2011 | 779    |
| 2012 | 179    |
| 2013 | 358    |
| 2014 | 455    |



38

## External Trade

### Exports

| H.S.        | Commodity                             | tonnes |       |                   | RM '000 |        |                   |
|-------------|---------------------------------------|--------|-------|-------------------|---------|--------|-------------------|
|             |                                       | 2012   | 2013  | 2014 <sup>P</sup> | 2012    | 2013   | 2014 <sup>P</sup> |
| 2530.90.100 | Xenotime                              | 299    | 7,624 | 9,567             | 52      | 38,257 | 41,808            |
| 2612.20.100 | Monazite                              | 122    | 184   | 525               | 2,104   | 1,594  | 2,019             |
| 2805.30.000 | Rare earth metals                     | –      | –     | –                 | –       | –      | –                 |
| 2846        | Cerium & other than cerium compounds* | 341    | 2,325 | 8,547             | 3,028   | 54,680 | 335,514           |

\* - sold in units other than tonnes



## Imports

| H.S.        | Commodity                             | tonnes |       |                   | RM '000 |        |                   |
|-------------|---------------------------------------|--------|-------|-------------------|---------|--------|-------------------|
|             |                                       | 2012   | 2013  | 2014 <sup>P</sup> | 2012    | 2013   | 2014 <sup>P</sup> |
| 2530.90.100 | Xenotime                              | 70     | 20    | 65                | 263     | 43     | 939               |
| 2612.20.100 | Monazite                              | –      | –     | –                 | –       | –      | –                 |
| 2805.30.000 | Rare earth metals                     | 2,118  | 7,447 | 51,630            | 19,167  | 80,185 | 269,363           |
| 2846        | Cerium & other than cerium compounds* | 2,097  | 193   | 167               | 70,428  | 11,859 | 8,413             |

\* - sold in units other than tonnes

## Malaysia's exports of xenotime, by country

| Country                              | 2012              |               | 2013              |                  | 2014 <sup>P</sup> |                  |
|--------------------------------------|-------------------|---------------|-------------------|------------------|-------------------|------------------|
|                                      | Quantity (tonnes) | Value (RM)    | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)       |
| <i>Xenotime</i><br>(HS: 2530.90.100) |                   |               |                   |                  |                   |                  |
| China                                | –                 | –             | 178               | 3,054,530        | 134               | 2,446,241        |
| India                                | –                 | –             | –                 | –                | 84                | 760,021          |
| Japan                                | –                 | –             | 41                | 195,941          | 31                | 119,819          |
| Sri Lanka                            | –                 | –             | 1                 | 6,556            | 25                | 102,357          |
| ROK                                  | –                 | –             | –                 | –                | 20                | 93,765           |
| Taiwan                               | –                 | –             | –                 | –                | 10                | 36,929           |
| Indonesia                            | 299               | 52,349        | –                 | –                | –                 | –                |
| <b>Total</b>                         | <b>299</b>        | <b>52,349</b> | <b>220</b>        | <b>3,257,027</b> | <b>304</b>        | <b>3,559,132</b> |

Source: Department of Statistics

## Malaysia's imports of xenotime, by country

| Country                              | 2012              |                | 2013              |               | 2014 <sup>P</sup> |                |
|--------------------------------------|-------------------|----------------|-------------------|---------------|-------------------|----------------|
|                                      | Quantity (tonnes) | Value (RM)     | Quantity (tonnes) | Value (RM)    | Quantity (tonnes) | Value (RM)     |
| <i>Xenotime</i><br>(HS: 2530.90.100) |                   |                |                   |               |                   |                |
| Germany                              | 60                | 133,417        | 20                | 43,108        | –                 | –              |
| UK                                   | 10                | 129,557        | –                 | –             | –                 | –              |
| China                                | –                 | –              | –                 | –             | 44                | 647,642        |
| USA                                  | –                 | –              | –                 | –             | 21                | 266,772        |
| <b>Total</b>                         | <b>70</b>         | <b>262,974</b> | <b>20</b>         | <b>43,108</b> | <b>65</b>         | <b>939,414</b> |

Source: Department of Statistics

## Malaysia's exports of monazite, by country

| Country                              | 2012              |                  | 2013              |                  | 2014 <sup>P</sup> |                  |
|--------------------------------------|-------------------|------------------|-------------------|------------------|-------------------|------------------|
|                                      | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)       |
| <i>Monazite</i><br>(HS: 2612.20.100) |                   |                  |                   |                  |                   |                  |
| China                                | 122               | 2,014,475        | 184               | 1,594,273        | 525               | 2,018,670        |
| <b>Total</b>                         | <b>122</b>        | <b>2,014,475</b> | <b>184</b>        | <b>1,594,273</b> | <b>525</b>        | <b>2,018,670</b> |

Source: Department of Statistics

## World mine production of rare earth minerals

| Country                      | tonnes         |                |                   | % of 2014 <sup>P</sup> |
|------------------------------|----------------|----------------|-------------------|------------------------|
|                              | 2012           | 2013           | 2014 <sup>P</sup> |                        |
| China                        | 100,000        | 95,000         | 95,000            | 86.36                  |
| USA                          | 800            | 5,500          | 7,000             | 6.36                   |
| India                        | 2,900          | 2,900          | 3,000             | 2.73                   |
| Russia                       | 2,400          | 2,500          | 2,500             | 2.27                   |
| Australia                    | 3,200          | 2,000          | 2,500             | 2.27                   |
| <b>Malaysia*</b>             | <b>179</b>     | <b>358</b>     | <b>455</b>        | <b>0.41</b>            |
| Vietnam                      | 220            | 220            | 200               | 0.20                   |
| Brazil                       | 140            | 330            | –                 | –                      |
| <b>World total (rounded)</b> | <b>111,000</b> | <b>110,000</b> | <b>110,000</b>    |                        |

Source: United States Geological Survey  
\*Minerals and Geoscience Department Malaysia

\* Revised figures based on actual production

## Review

Rare Earth Minerals (REMs) are a unique group of 15 chemical elements in the periodic table known as the Lanthanide series. They are used in a wide range of applications in improving energy efficiency, digital technology and enhancing environmental protection. Rare earths are used as catalysts, phosphors, and polishing compounds. Air pollution control, illuminated screens on electronic devices, and the polishing of optical-quality glass are some of its well-known uses. They are critical components in consumer electronics such as televisions, tablet computers, cameras and mobile phones. Due to their unique optical and magnetic properties, REMs are used to make rechargeable batteries found in hybrid cars. REMs are also essential to many green energy technologies and hence called Green Elements. The main economic minerals exploited for the rare earth contents are bastnasite, monazite and xenotime. In Malaysia, only monazite and xenotime are produced from various among retreatment plants located in Perak and Selangor as the REMs are not mined locally.

The global Rare Earth Elements (REE) market is valued at USD5 billion in 2014. China is the world's biggest rare earths producer and continued to dominate the global supply of rare earths and accounts for over 90% of global production. China also accounts for about 60% of global consumption. Demands from emerging economies are expected to drive the REE market. The application of rare earth magnets in wind turbines is expected to be another major growth factor for the global rare earth metals market over the long term.

In 2014, the total production of REMs in Malaysia increased 27.09% to 455 tonnes valued at RM3.97 million from 358 tonnes valued at RM2.86 million recorded in the previous year. These comprised 372 tonnes of monazite and 83 tonnes of xenotime. During the year, a total of 525 tonnes of monazite was exported to China. Malaysia imported 65 tonnes of xenotime and 51,630 tonnes rare earth metals during the same period.

In Malaysia, a rare earth processing plant was set up by Lynas Corp. Ltd. of Australia in Gebeng Industrial Park in Kuantan, Pahang. The plant, Lynas Advanced Materials Plant (LAMP), processes the rare earth concentrates brought from Australia. Lynas commenced commercial production and shipments of rare earths products in June 2013. The first stage of commissioning of the cracking and leaching rare earths extraction units of Phase 2 of the LAMP in Malaysia commenced in January 2014. The year 2014 marked Lynas' first full year of production.

In 2014, the Minerals and Geoscience Department Malaysia and the Academy of Sciences Malaysia have started a collaborative project to explore heavy rare earth elements (HREE) in the country. The exploration was conducted in four states, namely Negeri Sembilan, Pahang, Perak and Terengganu. The project is aimed at finding heavy rare earth elements in minerals. ■

## SILVER

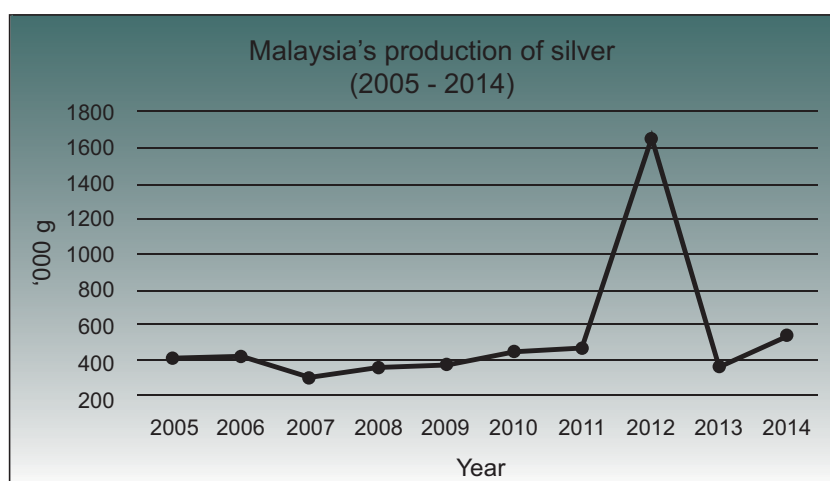
### Malaysia's production of silver

| State        | 2011           |          | 2012             |          | 2013           |          | 2014           |          |
|--------------|----------------|----------|------------------|----------|----------------|----------|----------------|----------|
|              | grams          | mines    | grams            | mines    | grams          | mines    | grams          | mines    |
| Pahang (a)   | 459,640        | –        | 1,627,711        | –        | 360,828        | –        | 533,391        | –        |
| <b>Total</b> | <b>459,640</b> | <b>–</b> | <b>1,627,711</b> | <b>–</b> | <b>360,828</b> | <b>–</b> | <b>533,391</b> | <b>–</b> |

(a) By-product of gold mining

### Malaysia's historic production of silver

| Year | '000 g  |
|------|---------|
| 2005 | 401.5   |
| 2006 | 410.6   |
| 2007 | 295.6   |
| 2008 | 349.2   |
| 2009 | 367.0   |
| 2010 | 436.0   |
| 2011 | 459.6   |
| 2012 | 1,627.7 |
| 2013 | 360.8   |
| 2014 | 533.4   |



42

### External Trade

#### Exports

| H.S.    | Commodity           | kg     |       |                   | RM '000 |       |                   |
|---------|---------------------|--------|-------|-------------------|---------|-------|-------------------|
|         |                     | 2012   | 2013  | 2014 <sup>P</sup> | 2012    | 2013  | 2014 <sup>P</sup> |
| 2616.10 | Silver ores & conc. | 16,450 | –     | –                 | 236     | –     | –                 |
| 7106.10 | Powder              | 10,356 | 4,152 | 238               | 35,674  | 9,867 | 2,607             |
| 7106.91 | Unwrought           | 15     | 38    | 79                | 45      | 121   | 259               |
| 7106.92 | Semi-manufactures   | 179    | 480   | 1,257             | 3,761   | 1,439 | 3,661             |

## Imports

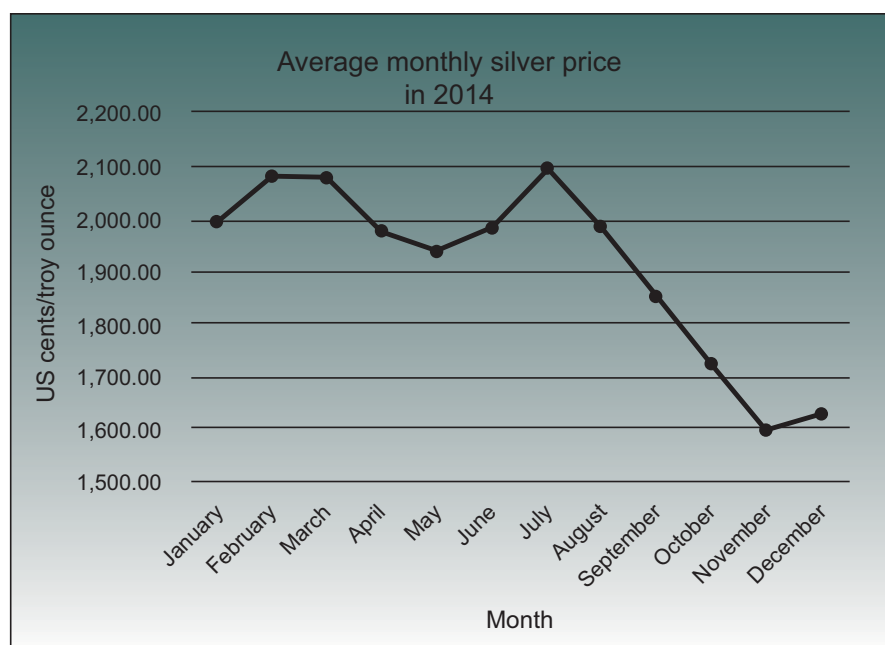
| H.S.    | Commodity           | kg      |           |                   | RM '000 |        |                   |
|---------|---------------------|---------|-----------|-------------------|---------|--------|-------------------|
|         |                     | 2012    | 2013      | 2014 <sup>P</sup> | 2012    | 2013   | 2014 <sup>P</sup> |
| 2616.10 | Silver ores & conc. | 735,406 | 3,152,612 | 485,108           | 11,883  | 53,482 | 8,705             |
| 7106.10 | Powder              | 10,205  | 7,361     | 9,967             | 37,826  | 21,091 | 26,502            |
| 7106.91 | Unwrought           | 11,967  | 11,307    | 7,820             | 29,691  | 21,679 | 14,762            |
| 7106.92 | Semi-manufactures   | 28,118  | 29,337    | 33,784            | 93,864  | 71,202 | 66,407            |

Source: Department of Statistics

## Price

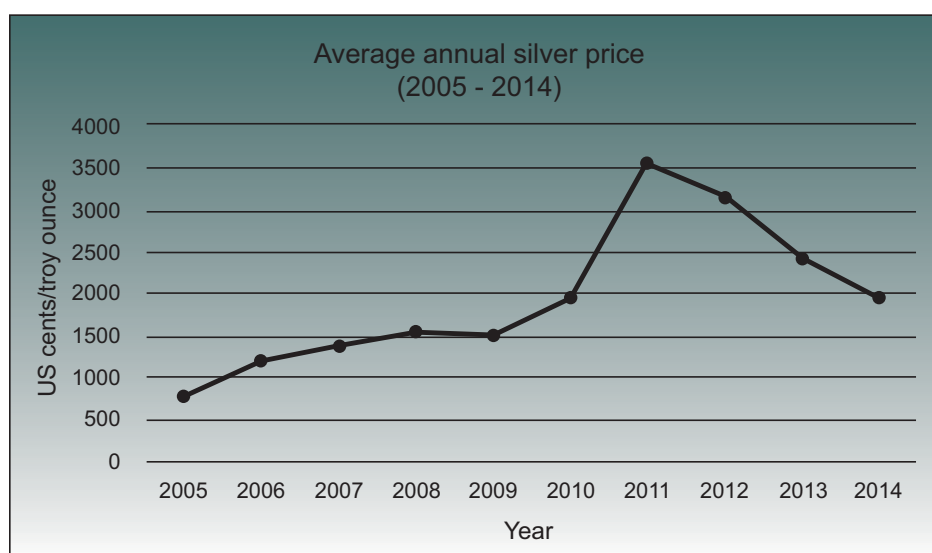
## Average monthly silver price in 2014

| 2014              | US cents/<br>troy ounce |
|-------------------|-------------------------|
| January           | 1,991.00                |
| February          | 2,077.00                |
| March             | 2,074.00                |
| April             | 1,971.00                |
| May               | 1,936.00                |
| June              | 1,978.00                |
| July              | 2,092.00                |
| August            | 1,980.00                |
| September         | 1,849.00                |
| October           | 1,719.00                |
| November          | 1,597.00                |
| December          | 1,624.00                |
| <b>Annual Avg</b> | <b>1,907.33</b>         |



## Average annual silver price (2005 - 2014)

| Year | US cents/<br>troy<br>ounce |
|------|----------------------------|
| 2005 | 733.96                     |
| 2006 | 1,156.97                   |
| 2007 | 1,341.47                   |
| 2008 | 1,500.34                   |
| 2009 | 1,469.57                   |
| 2010 | 1,913.98                   |
| 2011 | 3,526.42                   |
| 2012 | 3,121.17                   |
| 2013 | 2,385.85                   |
| 2014 | 1,907.33                   |



UNCTAD (Handy & Harman  
99.9% Grade Refined, New York)

## World mine production of silver

44

| Country                      | tonnes        |               |                   | % of 2014 <sup>p</sup> |
|------------------------------|---------------|---------------|-------------------|------------------------|
|                              | 2012          | 2013          | 2014 <sup>p</sup> |                        |
| Mexico                       | 5,360         | 4,860         | 4,700             | 18.01                  |
| China                        | 3,900         | 4,100         | 4,200             | 16.09                  |
| Peru                         | 3,480         | 3,670         | 3,700             | 14.18                  |
| Australia                    | 1,730         | 1,840         | 1,900             | 7.28                   |
| Russia                       | 1,500         | 1,720         | 1,700             | 6.51                   |
| Bolivia                      | 1,210         | 1,290         | 1,300             | 4.98                   |
| Chile                        | 1,190         | 1,170         | 1,200             | 4.60                   |
| Poland                       | 1,150         | 1,200         | 1,200             | 4.60                   |
| USA                          | 1,060         | 1,040         | 1,170             | 4.48                   |
| Canada                       | 663           | 627           | 646               | 2.48                   |
| Other countries              | 4,230         | 4,440         | 4,400             | 16.86                  |
| <b>World total (rounded)</b> | <b>25,500</b> | <b>26,000</b> | <b>26,100</b>     |                        |

Source: United States Geological Survey

## Review

In Malaysia, silver ores and concentrates were produced as a by-product from gold mining activities in Pahang since 2004. In 2014, a total of 533 kg silver valued at RM0.98 million was produced and has increased as much as 47.82% compared with 361 kg valued at RM1.05 million produced in 2013.

During the year, 238 kg of silver powder and 1,257 kg of silver semi-manufactured were exported whilst at the same time Malaysia imported a total of 485,108 kg of silver ores and concentrates to fulfill the local requirements. Imports of silver semi-manufactured increased to 33,784 kg from 29,337 kg recorded in 2013.

During the year, the average annual price of monthly silver price dropped to US cent 1,907.33 per troy ounce from US cent 2,385.85 per troy ounce in 2013. In Malaysia, silver occurrence has been reported within the silicified volcanic rocks at Gunung Pock and Gunung Wullersdorf in Semporna, Sabah. ■

## TANTALUM/NIOBIUM MINERALS

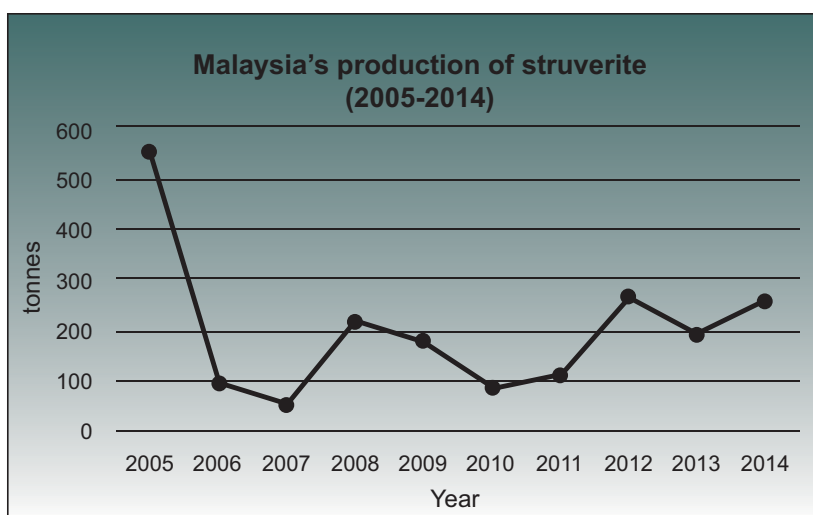
### Malaysia's production of tantalum/niobium minerals

| Mineral    | 2011   |       | 2012   |       | 2013   |       | 2014   |       |
|------------|--------|-------|--------|-------|--------|-------|--------|-------|
|            | tonnes | mines | tonnes | mines | tonnes | mines | tonnes | mines |
| Struverite | 110    | –     | 262    | –     | 190    | –     | 255    | –     |

Struverite is produced from among processing plant and exist as by-product of tin mining

### Malaysia's historic production of struverite

| Year | tonnes |
|------|--------|
| 2005 | 552    |
| 2006 | 93     |
| 2007 | 52     |
| 2008 | 216    |
| 2009 | 176    |
| 2010 | 84     |
| 2011 | 110    |
| 2012 | 262    |
| 2013 | 190    |
| 2014 | 255    |





## External Trade

## Exports

| H.S.        | Commodity                       | tonnes |      |                   | RM '000 |       |                   |
|-------------|---------------------------------|--------|------|-------------------|---------|-------|-------------------|
|             |                                 | 2012   | 2013 | 2014 <sup>P</sup> | 2012    | 2013  | 2014 <sup>P</sup> |
| 2615.90.110 | Columbite concentrates          | –      | –    | –                 | –       | –     | –                 |
| 2615.90.190 | Other niobium & tantalum concs. | –      | –    | –                 | –       | –     | –                 |
| 8103.90.000 | Other tantalum & arts. thereof  | 1      | 22   | –                 | 8       | 1,479 | –                 |

## Imports

| H.S.        | Commodity                       | tonnes |      |                   | RM '000 |      |                   |
|-------------|---------------------------------|--------|------|-------------------|---------|------|-------------------|
|             |                                 | 2012   | 2013 | 2014 <sup>P</sup> | 2012    | 2013 | 2014 <sup>P</sup> |
| 2615.90.110 | Columbite concentrates          | 264    | –    | –                 | 4,629   | –    | –                 |
| 2615.90.190 | Other niobium & tantalum concs. | 86     | –    | –                 | 1,672   | –    | –                 |
| 8103.90.000 | Other articles of tantalum      | 27     | 17   | 4                 | 1,051   | 617  | 451               |

## Malaysia's imports of tantalum/niobium minerals, by country

| Country  | 2012              |                  | 2013              |            | 2014 <sup>P</sup> |            |
|--|-------------------|------------------|-------------------|------------|-------------------|------------|
|  | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM) | Quantity (tonnes) | Value (RM) |
| <i>Columbite concentrates</i><br>(HS: 2615.90.110) |                   |                  |                   |            |                   |            |
| Nigeria  | 264               | 4,629,220        | –                 | –          | –                 | –          |
| <b>Total</b>                                       | <b>264</b>        | <b>4,629,220</b> | –                 | –          | –                 | –          |

Source: Department of Statistics

## World mine production of tantalum and niobium minerals

| Country                      | tonnes        |               |                   | % of 2014 <sup>p</sup> |
|------------------------------|---------------|---------------|-------------------|------------------------|
|                              | 2012          | 2013          | 2014 <sup>p</sup> |                        |
| <b>Niobium</b>               |               |               |                   |                        |
| Brazil                       | 45,000        | 53,100        | 53,000            | 89.83                  |
| Canada                       | 4,710         | 5,260         | 5,000             | 8.47                   |
| Other countries              | 375           | 1,000         | 1,000             | 1.69                   |
| <b>World total (rounded)</b> | <b>50,100</b> | <b>59,360</b> | <b>59,000</b>     |                        |
| <b>Tantalum</b>              |               |               |                   |                        |
| Rwanda                       | 150           | *600          | *600              | 54.69                  |
| Brazil                       | 140           | 98            | 98                | 8.93                   |
| Congo (Kinshasa)             | 100           | *200          | *200              | 18.23                  |
| Nigeria                      | 63            | 60            | 60                | 5.47                   |
| Canada                       | 50            | 5             | –                 | 0.00                   |
| Mozambique                   | 39            | 115           | 85                | 7.75                   |
| Burundi                      | 33            | 20            | 14                | 1.28                   |
| Ethiopia                     | 95            | 8             | 40                | 3.65                   |
| <b>World total (rounded)</b> | <b>670</b>    | <b>1106</b>   | <b>1097</b>       |                        |

\* Revisions based on new data posted on May 14, 2015.  
Source: United States Geological Survey

## Review

Tantalum-niobium mineral in the form of struverite is produced as a by-product of alluvial tin mining through the processing of tin tailing or 'amang'. Amang was processed at 19 amang processing plants located in Perak (17) and Selangor (2).

The supply of amang was entirely dependent on the mining operation of alluvial tin. There were 18 alluvial tin mines in 2014 compared with 16 mines in 2013. This has resulted in the increase of 34% production of struverite to 255 tonnes valued at RM4.08 million compared to 190 tonnes valued at RM3.04 million in 2013.

For the past 10 years, the highest production of struverite was recorded in 2005 which amounted to 552 tonnes whilst the lowest production was in 2007 with an amount of 52 tonnes. There were no export and import activities for columbite concentrates during the year 2014. ■

## TIN

## Malaysia's production of tin-in-concentrate

| State        | 2011               |           | 2012               |           | 2013               |           | 2014         |           |
|--------------|--------------------|-----------|--------------------|-----------|--------------------|-----------|--------------|-----------|
|              | tonnes             | mines     | tonnes             | mines     | tonnes             | mines     | tonnes       | mines     |
| Perak        | 2,917 <sup>+</sup> | 6         | 3,181 <sup>+</sup> | 5         | 3,213 <sup>+</sup> | 8         | 3,142        | 8         |
| Pahang       | 320                | 4         | 276                | 4         | 263                | 5         | 363          | 5         |
| Johor        | 46                 | 1         | 49                 | 2         | 65                 | 1         | 228          | 3         |
| Selangor     | 42 <sup>**</sup>   | –         | 119 <sup>**</sup>  | –         | 40 <sup>**</sup>   | –         | –            | –         |
| K. Lumpur    | 10 <sup>*</sup>    | –         | 24 <sup>*</sup>    | –         | 2 <sup>*</sup>     | –         | 7            | –         |
| Terengganu   | 5                  | 2         | 30                 | 1         | 32                 | 1         | 22           | 1         |
| Kedah        | –                  | 1         | 46                 | 1         | 82                 | 2         | 15           | 2         |
| <b>Total</b> | <b>3,340</b>       | <b>13</b> | <b>3,725</b>       | <b>13</b> | <b>3,697</b>       | <b>17</b> | <b>3,777</b> | <b>19</b> |

mines = indicates highest number of mines operating in a month during the year

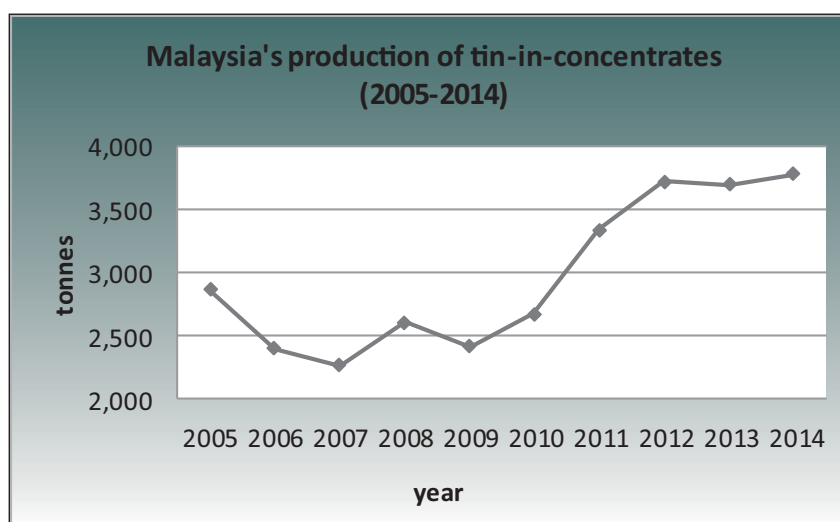
\* = production from panning activity

\*\* = production from amang retreatment plant

+ = production from amang retreatment plant and mining activity

## Malaysia's historic production of tin-in-concentrates

| Year | tonnes |
|------|--------|
| 2005 | 2,858  |
| 2006 | 2,398  |
| 2007 | 2,263  |
| 2008 | 2,605  |
| 2009 | 2,410  |
| 2010 | 2,668  |
| 2011 | 3,340  |
| 2012 | 3,725  |
| 2013 | 3,697  |
| 2014 | 3,777  |



## External Trade

## Exports

| H.S.    | Commodity                  | tonnes |        |                   | RM '000   |           |                   |
|---------|----------------------------|--------|--------|-------------------|-----------|-----------|-------------------|
|         |                            | 2012   | 2013   | 2014 <sup>P</sup> | 2012      | 2013      | 2014 <sup>P</sup> |
| 2609.00 | Tin ores & conc.           | 0.18   | 67     | 155               | 2         | 1,129     | 2,519             |
| 8001.10 | Unwrought, not alloyed     | 37,192 | 36,365 | 35,221            | 2,409,791 | 2,525,691 | 2,523,547         |
| 8001.20 | Unwrought, alloyed         | 1,025  | 1,022  | 1,441             | 74,217    | 68,319    | 90,177            |
| 8002.00 | Waste & scrap              | 2,119  | 2,699  | 14,278            | 1,839     | 7,841     | 8,666             |
| 8003.00 | Bars, rods, profile & wire | 1,209  | 903    | 1,380             | 36,879    | 46,243    | 76,584            |

## Imports

| H.S.    | Commodity                  | tonnes |        |                   | RM '000 |           |                   |
|---------|----------------------------|--------|--------|-------------------|---------|-----------|-------------------|
|         |                            | 2012   | 2013   | 2014 <sup>P</sup> | 2012    | 2013      | 2014 <sup>P</sup> |
| 2609.00 | Tin ores & conc.           | 26,536 | 30,274 | 33,222            | 927,973 | 1,138,959 | 1,341,705         |
| 8001.10 | Unwrought, not alloyed     | 15,262 | 12,063 | 8,184             | 980,950 | 818,064   | 491,466           |
| 8001.20 | Unwrought, alloyed         | 1,538  | 2,431  | 5,037             | 86,281  | 131,366   | 354,223           |
| 8002.00 | Waste & scrap              | 69     | 45     | 341               | 1,304   | 1,029     | 4,541             |
| 8003.00 | Bars, rods, profile & wire | 11,150 | 2,712  | 5,960             | 661,322 | 178,229   | 411,353           |

50

## Malaysia's exports of tin metal by country

| Country   | 2012              |                      | 2013              |                      | 2014 <sup>P</sup> |                      |
|---|-------------------|----------------------|-------------------|----------------------|-------------------|----------------------|
|   | Quantity (tonnes) | Value (RM)           | Quantity (tonnes) | Value (RM)           | Quantity (tonnes) | Value (RM)           |
| <i>Unwrought, not alloyed<br/>(HS: 8001.10.000)</i> |                   |                      |                   |                      |                   |                      |
| ROK   | 6,995             | 457,021,473          | 7,500             | 519,022,619          | 8,150             | 591,669,691          |
| USA   | 3,945             | 255,915,097          | 5,270             | 373,970,291          | 6,471             | 462,757,330          |
| India   | 5,185             | 336,074,263          | 7,867             | 545,035,445          | 5,726             | 414,587,263          |
| Japan   | 2,023             | 132,098,818          | 2,414             | 168,429,426          | 3,593             | 258,143,386          |
| Italy   | 1,580             | 102,447,579          | 1,997             | 142,557,745          | 2,829             | 206,740,555          |
| Others  | 17,464            | 1,126,233,851        | 11,317            | 776,675,632          | 8,452             | 589,649,003          |
| <b>Total</b>  | <b>37,192</b>     | <b>2,409,791,081</b> | <b>36,365</b>     | <b>2,525,691,158</b> | <b>35,221</b>     | <b>2,523,547,228</b> |

Source: Department of Statistics

## Malaysia's imports of tin ore and concentrates, by country

| Country   | 2012              |                    | 2013              |                      | 2014 <sup>P</sup> |                      |
|---|-------------------|--------------------|-------------------|----------------------|-------------------|----------------------|
|   | Quantity (tonnes) | Value (RM)         | Quantity (tonnes) | Value (RM)           | Quantity (tonnes) | Value (RM)           |
| <i>Tin ore &amp; concentrates (HS: 2609.00.000)</i> |                   |                    |                   |                      |                   |                      |
| Australia   | 10,985            | 323,012,740        | 12,031            | 391,069,142          | 11,682            | 390,179,094          |
| Congo   | 3,535             | 127,224,820        | 3,287             | 140,181,535          | 5,722             | 263,784,780          |
| Rwanda  | 4,653             | 194,656,534        | 4,454             | 183,137,273          | 3,293             | 143,137,013          |
| Nigeria   | 3,063             | 128,625,457        | 3,122             | 136,553,705          | 3,092             | 142,443,617          |
| China   | 189               | 8,537,426          | 1,119             | 52,505,548           | 2,258             | 98,853,254           |
| Others  | 4,111             | 145,916,043        | 6,260             | 235,511,902          | 7,173             | 303,307,401          |
| <b>Total</b>  | <b>26,536</b>     | <b>927,973,020</b> | <b>30,274</b>     | <b>1,138,959,105</b> | <b>33,222</b>     | <b>1,341,705,159</b> |

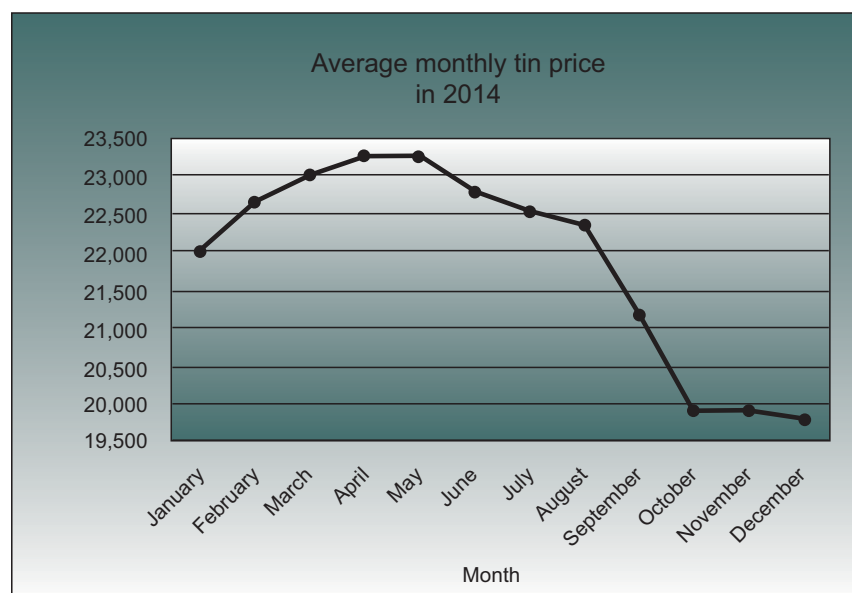
Source: Department of Statistics

## Price

## Average monthly tin price in 2014

| 2014              | USD/tonne     |
|-------------------|---------------|
| January           | 22,007        |
| February          | 22,658        |
| March             | 23,025        |
| April             | 23,266        |
| May               | 23,269        |
| June              | 22,801        |
| July              | 22,531        |
| August            | 22,356        |
| September         | 21,175        |
| October           | 19,931        |
| November          | 19,923        |
| December          | 19,797        |
| <b>Annual Avg</b> | <b>21,737</b> |

## Average monthly tin price in 2014

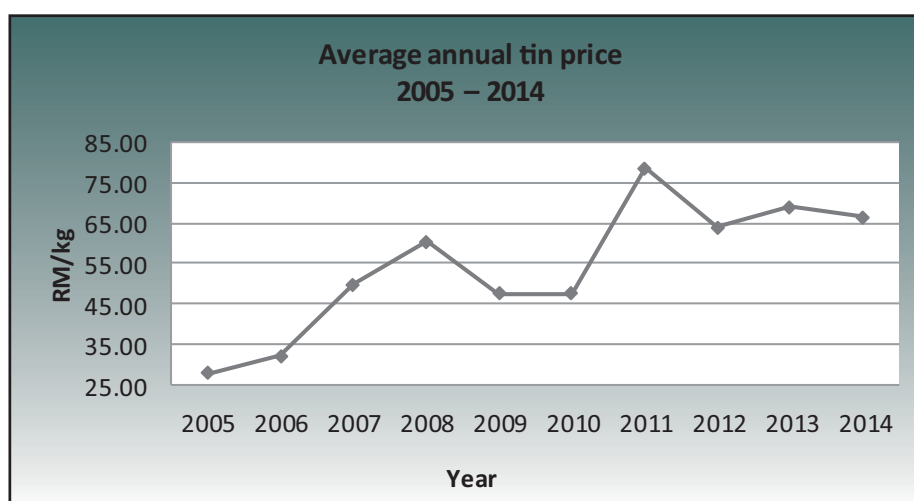


\*\* As from 1 Feb. 2001, KLTM price is quoted in U.S. Dollar.

Source: KLTM

### Average annual tin price 2005 - 2014

| Year | USD/tonne |
|------|-----------|
| 2005 | 7,410     |
| 2006 | 8,748     |
| 2007 | 14,477    |
| 2008 | 19,182    |
| 2009 | 13,556    |
| 2010 | 20,061    |
| 2011 | 26,235    |
| 2012 | 21,193    |
| 2013 | 22,322    |
| 2014 | 21,737    |



\* From 1995 to 2000, KLTM average price is based on turnover. From 2001, average price is weighted average against total tonnage.

Source: UNCTAD, KLTM, ex-smelter

### World mine production of tin 2012 - 2014<sup>P</sup>

| Country                      | tonnes (metal content) |                |                   | % of 2014 <sup>P</sup> |
|------------------------------|------------------------|----------------|-------------------|------------------------|
|                              | 2012                   | 2013           | 2014 <sup>P</sup> |                        |
| China                        | 110,000                | 110,000        | 125,000           | 42.24                  |
| Indonesia                    | 41,000                 | 95,200         | 84,000            | 28.39                  |
| Peru                         | 26,100                 | 23,700         | 23,700            | 8.01                   |
| Bolivia                      | 19,700                 | 19,300         | 18,000            | 6.08                   |
| Brazil                       | 10,800                 | 12,000         | 12,000            | 4.06                   |
| Australia                    | 5,000                  | 6,470          | 6,100             | 2.06                   |
| Vietnam                      | 5,400                  | 5,400          | 5,400             | 1.82                   |
| <b>Malaysia*</b>             | <b>3,725</b>           | <b>3,697</b>   | <b>3,777</b>      | <b>1.27</b>            |
| Congo (Kinshasa)             | 4,000                  | 3,000          | 3,000             | 1.01                   |
| Russia                       | 280                    | 420            | 600               | 0.20                   |
| Other countries              | 15,043                 | 14,570         | 14,600            | 4.93                   |
| <b>World total (rounded)</b> | <b>241,000</b>         | <b>293,760</b> | <b>295,900</b>    |                        |

Source: United States Geological Survey  
\* Minerals and Geoscience Department Malaysia

\* Revised figures based on actual production

## Review

The total tin-in-concentrates production of Malaysia registered a slight increase of 2% to 3,777 tonnes in 2014 compared to 3,697 tonnes produced in 2013. As in the previous years, Perak was the highest producer of tin with a total of 3,142 tonnes of production. The other states which produced tin-in-concentrates were Pahang (363 tonnes), Johor (228 tonnes), Terengganu (22 tonnes) and Kedah (15 tonnes). Meanwhile, a total of 378 tonnes of tin-in-concentrates was produced from panning activities in Perak and Kuala Lumpur.

In the year 2014, there were 19 active tin mines and 19 among retreatment plants in Malaysia. All 18 active mines were open cast mines which were located in Perak (8), Pahang (5), Johor (3), and Kedah (2). One underground mine was in Terengganu. During the same period, there were 17 among retreatment plants in Perak and two in Selangor. Open cast mines contributed the highest production of total tin-in-concentrates at 2,912 tonnes, followed by among retreatment plant (484 tonnes), and panning (378 tonnes).

The locally produced and imported tin ore and concentrates were processed by the Malaysia Smelting Corporation Bhd. (MSC). The MSC, located in Butterworth, Pulau Pinang is the country's sole tin smelter and the largest refined tin producer in this region. Malaysia exported a total of 35,221 tonnes worth RM2.5 billion of refined tin metal in 2014 compared with 36,365 tonnes worth RM2.5 billion

recorded in the previous year. During the year, a total of 33,222 tonnes tin ores and concentrates valued at RM1.34 billion was imported as against 30,273 tonnes valued at RM1.14 billion in the previous year. The imported tin ores were mainly from Australia, Congo, Rwanda, Nigeria, and China.

The annual average Kuala Lumpur Tin Market (KLTM) tin price in 2014 was USD21,737/tonne, decreased 2.6% compared to the annual average for 2013 (USD22,322/tonne). During the year, the tin prices showed an increasing trend from January to May and decreasing from June to December. The average monthly lowest price level was at USD19,797 per tonne in December while the highest price was recorded at USD23,269 per tonne in May.

During the year, the total domestic consumption of tin metal by the tin based industries decreased by 13.8% from 1,835 tonnes in 2013 to 1,581 tonnes. The consumption of tin by users in Malaysia was solder (58.3%), tin plate (32.9%), pewter (5.2%) and other manufacturing tin-based industries (3.6%). The tin consumption by the solder industry decreased to 922 tonnes from 1,078 tonnes, tin plate industry decreased to 520 tonnes from 561 tonnes, pewter industry decreased marginally to 82 tonnes from 100 tonnes and tin metal consumption in other domestic manufacturing industry decreased to 57 tonnes from 96 tonnes recorded in 2013 (Malaysia Tin Bulletin, 2014). ■

## TITANIUM

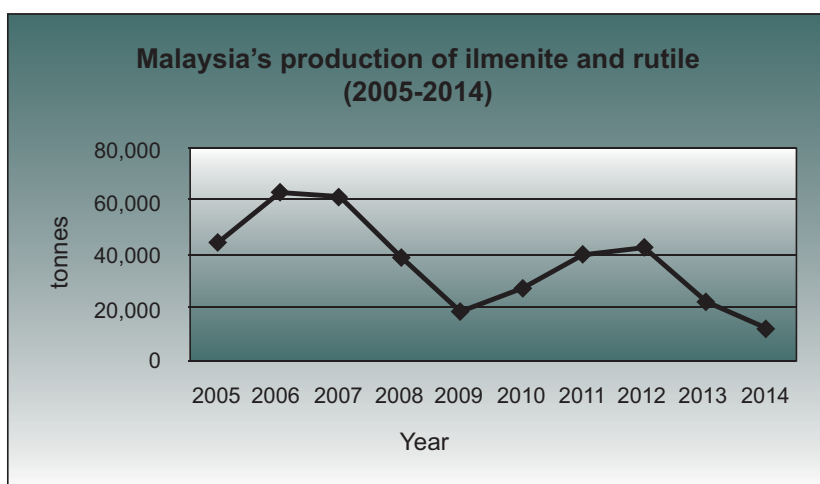
### Malaysia's production of titanium minerals

| Mineral      | 2011          |          | 2012          |          | 2013          |          | 2014          |          |
|--------------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|
|              | tonnes        | mines    | tonnes        | mines    | tonnes        | mines    | tonnes        | mines    |
| Ilmenite     | 28,782        | –        | 22,275        | –        | 16,043        | –        | 8,159         | –        |
| Rutile       | 10,810        | –        | 20,008        | –        | 5,983         | –        | 3,069         | –        |
| <b>Total</b> | <b>39,592</b> | <b>–</b> | <b>42,283</b> | <b>–</b> | <b>22,026</b> | <b>–</b> | <b>11,228</b> | <b>–</b> |

Both ilmenite and rutile are by-product of tin mining

### Malaysia's historic production of ilmenite & rutile

| Year | tonnes |
|------|--------|
| 2005 | 43,704 |
| 2006 | 62,570 |
| 2007 | 60,760 |
| 2008 | 38,613 |
| 2009 | 17,485 |
| 2010 | 26,603 |
| 2011 | 39,592 |
| 2012 | 42,283 |
| 2013 | 22,026 |
| 2014 | 11,228 |



54

## External Trade

### Exports

| H.S.        | Commodity                      | tonnes |       |                   | RM '000 |        |                   |
|-------------|--------------------------------|--------|-------|-------------------|---------|--------|-------------------|
|             |                                | 2012   | 2013  | 2014 <sup>P</sup> | 2012    | 2013   | 2014 <sup>P</sup> |
| 2614.00.100 | Ilmenite concentrates          | 7,090  | 6,719 | 391               | 7,829   | 4,142  | 341               |
| 2614.00.900 | Other titanium concentrates    | 754    | 621   | 927               | 7,251   | 7,245  | 7,813             |
| 2823.00.000 | Titanium oxides                | 3,501  | 3,392 | 2,251             | 30,262  | 22,505 | 12,029            |
| 8108.90.000 | Other articles of titanium (a) | 207    | 28    | 30                | 3,659   | 999    | 509               |



## Imports

| H.S.        | Commodity                      | tonnes |        |                   | RM '000 |        |                   |
|-------------|--------------------------------|--------|--------|-------------------|---------|--------|-------------------|
|             |                                | 2012   | 2013   | 2014 <sup>P</sup> | 2012    | 2013   | 2014 <sup>P</sup> |
| 2614.00.100 | Ilmenite concentrates          | 44,437 | 70,449 | 118,290           | 90,130  | 66,947 | 80,607            |
| 2614.00.900 | Other titanium concentrates    | 2,803  | 2,082  | 3,181             | 19,817  | 13,418 | 13,314            |
| 2823.00.000 | Titanium oxides                | 7,575  | 7,488  | 9,313             | 80,558  | 65,482 | 64,565            |
| 7202.91.000 | Ferro-titanium                 | 170    | 225    | 236               | 3,111   | 3,479  | 3,481             |
| 8108.90.000 | Other articles of titanium (a) | 503    | 1,465  | 1,199             | 21,016  | 35,225 | 42,655            |

(a) = including waste and scrap

## Malaysia's exports of ilmenite, by country

| Country                              | 2012              |                  | 2013              |                  | 2014 <sup>P</sup> |                |
|--------------------------------------|-------------------|------------------|-------------------|------------------|-------------------|----------------|
|                                      | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)     |
| <i>Ilmenite</i><br>(HS: 2614.00.100) |                   |                  |                   |                  |                   |                |
| China                                | 500               | 3,506,000        | 6,310             | 3,677,000        | 371               | 336,000        |
| India                                | 5,851             | 3,407,000        | 399               | 451,000          | 20                | 5,084          |
| Japan                                | 740               | 916,000          | 10                | 13,700           | –                 | –              |
| Others                               | –                 | –                | –                 | –                | –                 | –              |
| <b>Total</b>                         | <b>7,090</b>      | <b>7,829,000</b> | <b>6,719</b>      | <b>4,142,000</b> | <b>391</b>        | <b>341,084</b> |

Source: Department of Statistics

55

## Malaysia's imports of ilmenite, by country

| Country                           | 2012              |                   | 2013              |                   | 2014 <sup>P</sup> |                   |
|-----------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|                                   | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        |
| <i>Ilmenite (HS: 2614.00.100)</i> |                   |                   |                   |                   |                   |                   |
| India                             | 8,176             | 36,782,000        | 42,588            | 46,128,000        | 102,867           | 61,903,000        |
| Australia                         | 16,576            | 16,910,000        | 27,687            | 19,998,000        | 160               | 686,000           |
| UK                                | 58                | 324,000           | 108               | 640,000           | 72                | 419,000           |
| Mozambique                        | 10,000            | 13,162,000        | –                 | –                 | 15,170            | 17,572,000        |
| Thailand                          | –                 | –                 | 27                | 63,000            | 21                | 26,000            |
| Others                            | 19,686            | 36,439            | –                 | –                 | –                 | –                 |
| <b>Total</b>                      | <b>44,437</b>     | <b>90,130,000</b> | <b>70,449</b>     | <b>66,947,000</b> | <b>118,290</b>    | <b>80,606,000</b> |

Source: Department of Statistics

## Price

| Titanium  | 2011          | 2012          | 2013          | 2014         |
|---|---------------|---------------|---------------|--------------|
| <b>Ilmenite</b><br><b>Australian, min. 54% TiO<sub>2</sub>, FOB</b>           |               |               |               |              |
| Bulk concentrates   | US\$195       | US\$300       | US\$265       | US\$165      |
| Spot prices   | US\$140-250   | US\$250-350   | US\$230-350   | US\$180-230  |
| <b>Rutile</b><br><b>Australian concentrate, min. 95% TiO<sub>2</sub>, FOB</b> |               |               |               |              |
| Bulk (large volume, pigment grade)  | US\$1,350     | US\$2,200     | US\$1,250     | US\$975      |
| Bagged (small parcel, welding grade)  | US\$1348-1600 | US\$2050-2400 | US\$1100-1400 | US\$930-1080 |

Source: Industrial Minerals, April 2014

## World production of titanium minerals

## Ilmenite

56

| Country                      | tonnes           |                  |                   | % of 2014 <sup>P</sup> |
|------------------------------|------------------|------------------|-------------------|------------------------|
|                              | 2012             | 2013             | 2014 <sup>P</sup> |                        |
| South Africa <sup>a</sup>    | 1,100,000        | 1,190,000        | 1,100,00          | 16.44                  |
| China                        | 960,000          | 1,020,000        | 1,000,000         | 14.95                  |
| Australia                    | 940,000          | 960,000          | 1,100,000         | 16.44                  |
| Canada <sup>a</sup>          | 750,000          | 770,000          | 900,000           | 13.45                  |
| Vietnam                      | 510,000          | 720,000          | 500,000           | 7.47                   |
| Mozambique                   | 350,000          | 430,000          | 500,000           | 7.47                   |
| Madagascar                   | 380,000          | 264,000          | 340,000           | 5.08                   |
| Ukraine                      | 360,000          | 150,000          | 210,000           | 3.14                   |
| Norway <sup>a</sup>          | 360,000          | 498,000          | 400,000           | 5.98                   |
| India                        | 340,000          | 340,000          | 340,000           | 5.08                   |
| United States <sup>b</sup>   | 300,000          | 200,000          | 100,000           | 1.49                   |
| Brazil                       | 45,000           | 100,000          | 70,000            | 1.05                   |
| Sri Lanka                    | 32,000           | 32,000           | 32,000            | 0.48                   |
| Malaysia <sup>*</sup>        | 22,275           | 16,043           | 8,159             | 0.12                   |
| Other countries              | 51,725           | 60,000           | 90,000            | 1.35                   |
| <b>World total (rounded)</b> | <b>6,500,000</b> | <b>6,750,000</b> | <b>6,690,000</b>  |                        |

**Rutile**

| Country                                  | tonnes         |                |                   | % of 2014 <sup>P</sup> |
|--|----------------|----------------|-------------------|------------------------|
|  | 2012           | 2013           | 2014 <sup>P</sup> |                        |
| Australia                                | 410,000        | 423,000        | 480,000           | 62.91                  |
| South Africa                             | 120,000        | 59,000         | 65,000            | 8.52                   |
| Sierra Leone                             | 89,000         | 81,000         | 120,000           | 15.73                  |
| Ukraine                                  | 56,000         | 50,000         | 50,000            | 6.55                   |
| India                                    | 24,000         | 24,000         | 26,000            | 3.40                   |
| Mozambique                               | 7,000          | 9,000          | -                 | -                      |
| <b>Malaysia*</b>                         | <b>20,008</b>  | <b>14,000</b>  | <b>14,000</b>     | <b>1.83</b>            |
| Brazil                                   | 2,000          | 2,000          | -                 | -                      |
| Other countries                          | 3,992          | 8,000          | 8,000             | 1.05                   |
| <b>World total (rounded)<sup>c</sup></b> | <b>730,000</b> | <b>670,000</b> | <b>763,000</b>    |                        |

|   |                  |                  |                  |
|---|------------------|------------------|------------------|
| <b>World total (ilmenite and rutile, rounded)</b> | <b>7,230,000</b> | <b>7,420,000</b> | <b>7,453,000</b> |
|---|------------------|------------------|------------------|

- <sup>a</sup> Mine production is primarily used to produce titaniferous slag.  
<sup>b</sup> Includes rutile.  
<sup>c</sup> Excludes U.S production.

Source: United States Geological Survey  
\* Minerals and Geoscience Department Malaysia

**Review**

Titanium mineral concentrates of economic importance include ilmenite, leucosene, rutile, titaniferous slag, and synthetic rutile. The consumption of titanium mineral concentrates is tied to the consumption of TiO<sub>2</sub> pigments primarily used in the making of industrial paint, paper, and plastics. It is also used in welding rod coatings and for manufacturing carbides, chemicals, and metal.

In Malaysia, only ilmenite and rutile are produced which comes from the mining and processing of among alluvial tin mining tailings. Since 2003, no ilmenite is produced from mining operations as the country's only ilmenite mine located in Ajil, Terengganu ceased operations due to the depletion of high-grade reserves within their lease area. Since then, the production of titanium minerals in Malaysia are from among retreatment plants which are located in Perak and Selangor.

In 2014, the total titanium mineral production decreased by 49% to 11,228 tonnes compared with 22,026 tonnes produced in 2013. The mineral was

consumed locally and exported. During the year, Malaysia's exports of ilmenite dropped to 391 tonnes valued at RM0.34 million from 6,719 tonnes valued at RM4.1 million as recorded in 2013. The ilmenite export destinations were mainly to China and India.

For 2014, total imports of ilmenite at 118,290 tonnes valued at RM80.6 million. The main source of imported ilmenite and other titanium concentrates for the year were from India, Australia, UK, Mozambique and Thailand.

In Malaysia, the main downstream titanium industry is the beneficiation of synthetic rutile and manufacture of titanium dioxide (TiO<sub>2</sub>) pigments. Synthetic rutile, the raw material used in titanium dioxide pigments is being produced by TOR Minerals Malaysia Sdn. Bhd. located in Ipoh, in which the raw ilmenite feedstock is obtained locally. Tioxide (Malaysia) Sdn. Bhd. is a company which manufactures titanium dioxide and the biggest consumer of ilmenite in Malaysia. The total volume of ilmenite ore consumed by Tioxide (Malaysia) Sdn. Bhd. is about 130,000 tonnes annually. ■

## ZIRCON

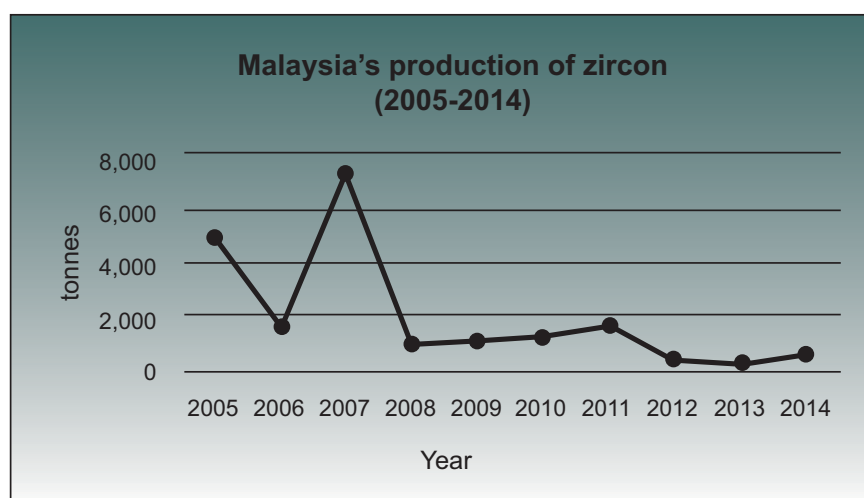
### Malaysia's production of zircon

| Mineral | 2011   |       | 2012   |       | 2013   |       | 2014   |       |
|---------|--------|-------|--------|-------|--------|-------|--------|-------|
|         | tonnes | mines | tonnes | mines | tonnes | mines | tonnes | mines |
| Zircon  | 1,685  | –     | 442    | –     | 379    | –     | 677    | –     |

Zircon is by-product of tin mining

### Malaysia's historic production of zircon

| Year | tonnes |
|------|--------|
| 2005 | 4,953  |
| 2006 | 1,690  |
| 2007 | 7,393  |
| 2008 | 984    |
| 2009 | 1,145  |
| 2010 | 1,261  |
| 2011 | 1,685  |
| 2012 | 442    |
| 2013 | 379    |
| 2014 | 677    |



58

## External Trade

### Exports

| H.S.                      | Commodity                    | tonnes |        |                   | RM '000 |         |                   |
|---------------------------|------------------------------|--------|--------|-------------------|---------|---------|-------------------|
|                           |                              | 2012   | 2013   | 2014 <sup>P</sup> | 2012    | 2013    | 2014 <sup>P</sup> |
| 2615.10.000 & 2615.10.100 | Zirconium ore & concs.       | 2,760  | 23,881 | 6,155             | 18,407  | 141,494 | 38,444            |
| 2615.10.009 & 2615.90.000 | Other zirconium ore & concs. | 1,616  | 1,343  | 334               | 6,286   | 3,688   | 32,460            |
| 8109.20.000               | Unwrought zirconium: powders | –      | –      | –                 | –       | –       | –                 |

## Imports

| H.S.                      | Commodity                    | tonnes |        |                   | RM '000 |         |                   |
|---------------------------|------------------------------|--------|--------|-------------------|---------|---------|-------------------|
|                           |                              | 2012   | 2013   | 2014 <sup>P</sup> | 2012    | 2013    | 2014 <sup>P</sup> |
| 2615.10.000 & 2615.10.100 | Zirconium ore & concs.       | 31,153 | 49,430 | 16,045            | 204,561 | 201,972 | 74,081            |
| 2615.10.009 & 2615.90.000 | Other zirconium ore & concs. | 1,768  | 374    | 1,190             | 11,338  | 8,564   | 18,324            |
| 8109.20.000               | Unwrought zirconium: powders | 0.5    | 16     | 22                | 48      | 133     | 240               |

Source: Department of Statistics

## Malaysia's exports of zircon, by country

| Country  | 2012              |                   | 2013              |                    | 2014 <sup>P</sup> |                   |
|--|-------------------|-------------------|-------------------|--------------------|-------------------|-------------------|
|  | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)         | Quantity (tonnes) | Value (RM)        |
| Zirconium & conc.<br>(HS: 2615.10.000 & 2615.10.100) |                   |                   |                   |                    |                   |                   |
| UAE  | 607               | 4,489,128         | 8,555             | 50,914,134         | 1,930             | 16,178,525        |
| India  | 1,500             | 10,214,907        | 12,893            | 75,260,017         | 2,385             | 14,003,827        |
| Hong Kong  | -                 | -                 | 143               | 902,839            | 188               | 2,540,750         |
| Saudi Arabia   | -                 | -                 | -                 | -                  | 250               | 612,837           |
| China  | 344               | 1,434,333         | 511               | 3,718,571          | 790               | 1,327,260         |
| Others   | 309               | 2,268,542         | 1,779             | 10,698,557         | 612               | 3,781,309         |
| <b>Total</b>   | <b>2,760</b>      | <b>18,406,910</b> | <b>23,881</b>     | <b>141,494,118</b> | <b>6,155</b>      | <b>38,444,508</b> |

59

## Malaysia's imports of zircon, by country

| Country  | 2012              |                    | 2013              |                    | 2014 <sup>P</sup> |                   |
|--|-------------------|--------------------|-------------------|--------------------|-------------------|-------------------|
|  | Quantity (tonnes) | Value (RM)         | Quantity (tonnes) | Value (RM)         | Quantity (tonnes) | Value (RM)        |
| Zirconium & conc.<br>(HS: 2615.10.000 & 2615.10.100) |                   |                    |                   |                    |                   |                   |
| Australia  | 29,992            | 199,132,999        | 48,300            | 195,542,801        | 14,341            | 50,007,500        |
| Rwanda   | -                 | -                  | -                 | -                  | 770               | 14,362,040        |
| Nigeria  | -                 | -                  | -                 | -                  | 112               | 5,628,066         |
| Japan  | 112               | 288,912            | 326               | 1,613,764          | 503               | 2,421,150         |
| ROK  | 41                | 358,520            | 423               | 2,672,594          | 80                | 441,955           |
| Others   | 1,007             | 4,780,496          | 381               | 2,142,461          | 239               | 1,220,643         |
| <b>Total</b>   | <b>31,152</b>     | <b>204,560,927</b> | <b>49,430</b>     | <b>201,971,620</b> | <b>16,045</b>     | <b>74,081,354</b> |

Source: Department of Statistics

## Price

| Zircon  | 2011             | 2012             | 2013             | 2014           |
|---|------------------|------------------|------------------|----------------|
| <b>FOB Australian, bulk shipment, per tonne</b>   |                  |                  |                  |                |
| Premium   | USD1,000 - 1,050 | USD2,500 - 2,640 | USD2,100 - 3,000 | USD1,250-1,350 |
| Standard  | USD850 - 890     | USD2,400 - 2,600 | USD2,000 - 2,150 | USD1,100-1,200 |
| <b>FOB USA, bulk shipment, per tonne</b>          |                  |                  |                  |                |
| Ceramic grade                                     | –                | –                | –                | –              |
| Refractory applications                           | –                | –                | –                | –              |
| Foundry sand applications                         | –                | –                | –                | –              |
| Premium   | USD880 - 900     | USD2,600 - 3,000 | USD2,600 - 3,000 | USD1,050-1,450 |
| Standard  | USD830 - 890     | USD2,550 - 2,750 | USD2,550 - 2,750 | USD950-1,150   |
| <b>FOB South Africa, bulk shipment, per tonne</b> |                  |                  |                  |                |
| Ceramic grade                                     | –                | USD2,300 - 2,650 | USD2,300 - 2,650 | USD1,500-1,700 |

Source: Industrial Minerals, April 2014

## World mine production of zirconium minerals

| Country                      | tonnes           |                  |                   | % of 2014 <sup>P</sup> |
|------------------------------|------------------|------------------|-------------------|------------------------|
|                              | 2012             | 2013             | 2014 <sup>P</sup> |                        |
| Australia                    | 605,000          | 850,000          | 900,000           | 58.44                  |
| South Africa                 | 380,000          | 170,000          | 170,000           | 11.04                  |
| China                        | 140,000          | 150,000          | 140,000           | 9.09                   |
| Indonesia                    | 120,000          | 110,000          | 120,000           | 7.79                   |
| Mozambique                   | 47,000           | 47,000           | 56,000            | 3.64                   |
| India                        | 40,000           | 41,000           | 40,000            | 2.60                   |
| <b>Malaysia*</b>             | <b>442</b>       | <b>379</b>       | <b>677</b>        | <b>0.04</b>            |
| Other countries              | 129,558          | 140,000          | 110,000           | 7.14                   |
| <b>World total (rounded)</b> | <b>1,460,000</b> | <b>1,510,000</b> | <b>1,540,000</b>  |                        |

Source: United States Geological Survey  
Minerals and Geoscience Department Malaysia

\* Revised figures based on actual production

## Review

Zircon is produced as a by-product from tin mining and processing of 'amang'. Zircon is widely used locally in ceramics, refractories and foundry applications. Since there is no local zircon mine, zircon is recovered only from the processing of 'amang' from alluvial tin mining by amang retreatment plants. In 2014, there were 19 amang retreatment plants and they are located in Perak (17) and Selangor (2).

During the year, the production of zircon increased to 677 tonnes from 379 tonnes in 2013. Exports of zircon has decreased to 6,155 tonnes from 23,881 tonnes where India, China, Thailand and Taiwan were the major destinations. During 2014, Malaysia imported a total of 16,044 tonnes of zircon and concentrates mostly from Australia. Malaysia's zircon production in 2014 constitutes about 0.04% of the world's total production.

In 2014, the exports value of zircon and concentrates has decreased to RM38.4 million compared to RM141.5 million in 2013. Most of the produced zircon were for exports mainly to UAE, India, Hong Kong, Saudi Arabia and China. Malaysia also imported zircon and concentrates. During 2014, a total of 16,045 tonnes valued at RM74.08 million was imported mostly from Australia, Rwanda, Nigeria, Japan and ROK. ■

**FOTO: NON-METALLIC MINERALS**



## AGGREGATES

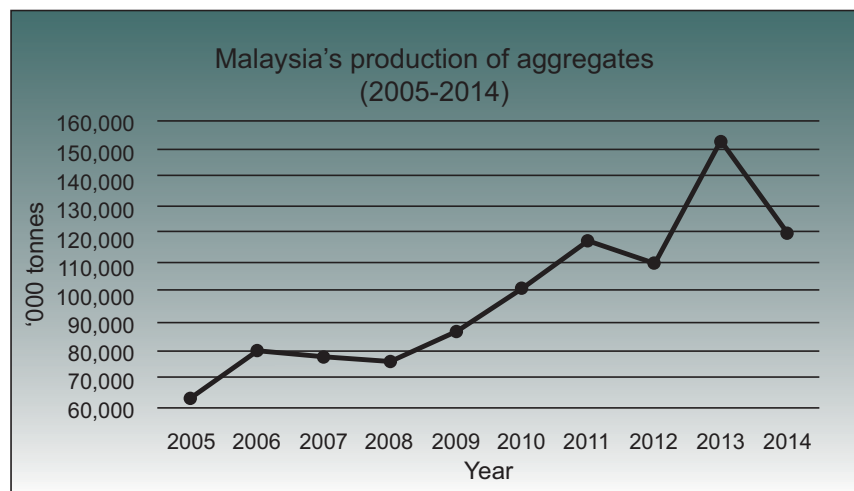
### Malaysia's production of aggregates

| State           | 2011           |            | 2012           |            | 2013           |            | 2014           |            |
|-----------------|----------------|------------|----------------|------------|----------------|------------|----------------|------------|
|                 | '000 tonnes    | quarries   | '000 tonnes    | quarries   | '000 tonnes    | quarries   | '000 tonnes    | quarries   |
| Perak           | 15,273         | 54         | 15,285         | 54         | 24,607         | 63         | 17,338         | 63         |
| Sarawak         | 10,120         | 43         | 11,965         | 46         | 10,587         | 48         | 10,587         | 48         |
| Johor           | 29,595         | 44         | 23,704         | 47         | 41,747         | 47         | 39,612         | 46         |
| Sabah           | 2,446          | 17         | 3,215          | 17         | 5,263          | 41         | 4,736          | 43         |
| Selangor & KL   | 25,454         | 32         | 23,244         | 28         | 25,522         | 30         | 27,550         | 30         |
| Pahang          | 4,216          | 27         | 3,710          | 30         | 3,859          | 30         | 3,718          | 30         |
| Kedah           | 4,984          | 18         | 5,173          | 18         | 10,073         | 20         | 4,580          | 19         |
| Negeri Sembilan | 7,562          | 17         | 6,252          | 17         | 11,336         | 18         | 15,404         | 18         |
| Pulau Pinang    | 6,414          | 14         | 7,079          | 14         | 6,776          | 17         | 6,530          | 17         |
| Terengganu      | 3,684          | 15         | 4,807          | 15         | 5,581          | 15         | 679            | 16         |
| Kelantan        | 2,809          | 11         | 2,681          | 12         | 2,750          | 13         | 2,373          | 13         |
| Melaka          | 5,160          | 8          | 2,449          | 9          | 2,158          | 8          | 2,697          | 8          |
| Perlis          | 793            | 2          | 774            | 14         | 2,916          | 6          | 356            | 7          |
| <b>Total</b>    | <b>118,510</b> | <b>302</b> | <b>110,339</b> | <b>312</b> | <b>153,173</b> | <b>356</b> | <b>136,162</b> | <b>358</b> |

63

### Malaysia's historic production of aggregates

| Year | '000 tonnes |
|------|-------------|
| 2005 | 62,762      |
| 2006 | 79,913      |
| 2007 | 77,674      |
| 2008 | 75,883      |
| 2009 | 86,497      |
| 2010 | 101,809     |
| 2011 | 118,510     |
| 2012 | 110,339     |
| 2013 | 153,173     |
| 2014 | 136,162     |



## External Trade

## Exports

| H.S. | Commodity  | tonnes     |           |                   | RM '000 |         |                   |
|------|------------|------------|-----------|-------------------|---------|---------|-------------------|
|      |            | 2012       | 2013      | 2014 <sup>P</sup> | 2012    | 2013    | 2014 <sup>P</sup> |
| 2517 | Aggregates | 10,443,174 | 4,418,740 | 3,390,939         | 396,604 | 144,510 | 122,274           |

## Imports

| H.S. | Commodity  | tonnes |        |                   | RM '000 |        |                   |
|------|------------|--------|--------|-------------------|---------|--------|-------------------|
|      |            | 2012   | 2013   | 2014 <sup>P</sup> | 2012    | 2013   | 2014 <sup>P</sup> |
| 2517 | Aggregates | 48,954 | 42,900 | 49,087            | 25,539  | 26,181 | 26,071            |

## Malaysia's exports of aggregates, by country

| Country                      | 2012              |                    | 2013              |                    | 2014 <sup>P</sup> |                    |
|------------------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|
|                              | Quantity (tonnes) | Value (RM)         | Quantity (tonnes) | Value (RM)         | Quantity (tonnes) | Value (RM)         |
| <i>Aggregates (HS: 2517)</i> |                   |                    |                   |                    |                   |                    |
| Singapore                    | 9,304,307         | 365,306,624        | 3,626,868         | 123,866,685        | 2,333,392         | 93,304,322         |
| Brunei                       | 561,067           | 15,619,980         | 272,220           | 7,612,426          | 695,652           | 15,767,329         |
| Indonesia                    | 562,259           | 10,776,219         | 501,187           | 10,812,212         | 341,506           | 10,789,000         |
| Myanmar                      | 660               | 34,704             | 840               | 789,600            | 1,177             | 1,169,196          |
| Maldives                     | -                 | -                  | 17,483            | 1,410,332          | 17,345            | 455,755            |
| Others                       | 8,329             | 186,469            | 142               | 123,577            | 1,866             | 788,573            |
| <b>Total</b>                 | <b>10,436,622</b> | <b>391,923,996</b> | <b>4,418,740</b>  | <b>144,614,832</b> | <b>3,390,939</b>  | <b>122,274,175</b> |

Source: Department of Statistics

## Malaysia's imports of aggregates, by country

| Mineral                      | 2012              |                   | 2013              |                   | 2014 <sup>p</sup> |                   |
|------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|                              | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        |
| <i>Aggregates (HS: 2517)</i> |                   |                   |                   |                   |                   |                   |
| China                        | 14,574            | 7,173,660         | 7,313             | 4,961,235         | 10,862            | 5,693,330         |
| New Zealand                  | 2,410             | 3,287,887         | 3,683             | 4,823,068         | 4,669             | 5,339,646         |
| Vietnam                      | 15,404            | 4,732,420         | 14,889            | 4,323,228         | 14,348            | 4,215,025         |
| Philippines                  | 9,551             | 3,722,177         | 5,676             | 3,506,752         | 6,261             | 3,229,599         |
| Japan                        | 1,675             | 2,667,792         | 6,092             | 2,080,781         | 8,614             | 2,462,407         |
| Others                       | 5,340             | 3,955,028         | 5,248             | 6,486,118         | 4,333             | 5,130,762         |
| <b>Total</b>                 | <b>48,954</b>     | <b>25,538,964</b> | <b>42,901</b>     | <b>26,181,182</b> | <b>49,087</b>     | <b>26,070,769</b> |

Source: Department of Statistics

## Review

Aggregates refer to rock fragments that may be used in their natural state or after mechanical processing, such as crushing, washing, or sizing. Rock aggregates form a major raw material for the construction industry as well as for the manufacturing of cement, agriculture application, chemical and metallurgical industries.

In 2014, there were 358 quarries producing various types of rock aggregates in Malaysia compared to 356 in the previous year. There were 13 types of rock being quarried with granite and limestone being the most common. Out of the 358 quarries, 201 are granite quarries, 78 limestone quarries, 44 sandstone quarries and slightly more than 30 other rock type quarries. The state with the most number of quarries is Perak (63), followed by Sarawak (48), Johor (46), Sabah (43), Pahang (30) and Selangor/Kuala Lumpur (30).

The country's rock aggregate production for 2014 showed a decrease of 11% to 136.2 Mt from 153.2 Mt in the previous year. This was due to a drop in production from Perak followed by Kedah and Johor. Most of the country's aggregates were produced by quarries in Johor, which accounted for over 29% of the country's total rock aggregate production.

The bulk of the production was for domestic use and some for export. In 2014, a total of 3.4 Mt of aggregates valued at RM122.27million was exported to neighboring countries, mainly to Singapore, Indonesia and Brunei compared to 4.4 Mt valued at RM144.6million in previous the year. The quantity of rock aggregates exported had decreased by 23% in 2014 compared to 2013. Malaysia also imported aggregates amounting to 49,087 tonnes, increased by 14.4% from 42,901 recorded in 2013. ■

## BARYTES

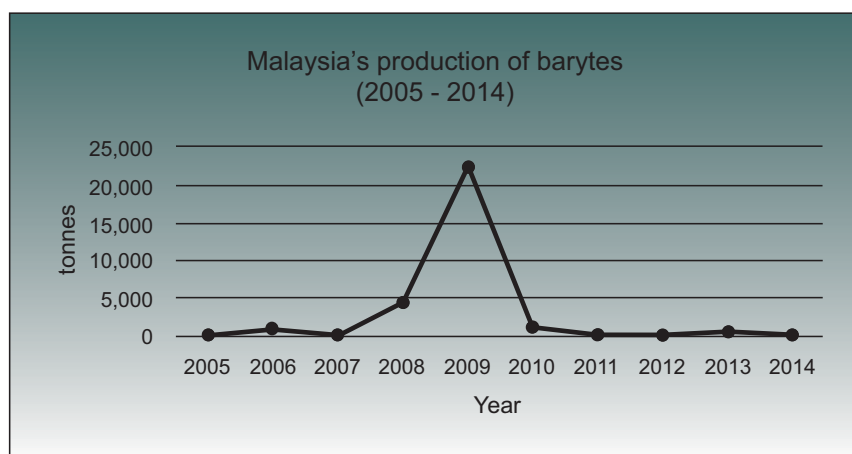
### Malaysia's production of barytes, by state, 2011 - 2014

| State        | 2011   |          | 2012   |       | 2013       |       | 2014   |          |
|--------------|--------|----------|--------|-------|------------|-------|--------|----------|
|              | tonnes | mines    | tonnes | mines | tonnes     | mines | tonnes | mines    |
| Kelantan     | –      | –        | –      | –     | 500        | 1     | –      | 1        |
| Pahang       | –      | 3        | –      | –     | –          | –     | –      | –        |
| <b>Total</b> | –      | <b>3</b> | –      | –     | <b>500</b> | –     | –      | <b>1</b> |

### Malaysia's historic production of barytes

66

| Year | tonnes |
|------|--------|
| 2005 | –      |
| 2006 | 910    |
| 2007 | –      |
| 2008 | 4,372  |
| 2009 | 22,390 |
| 2010 | 1,000  |
| 2011 | –      |
| 2012 | –      |
| 2013 | 500    |
| 2014 | –      |



Source: Minerals and Geoscience Department Malaysia

## External Trade

## Exports

| H.S.    | Commodity | tonnes |       |                   | RM '000 |       |                   |
|---------|-----------|--------|-------|-------------------|---------|-------|-------------------|
|         |           | 2012   | 2013  | 2014 <sup>P</sup> | 2012    | 2013  | 2014 <sup>P</sup> |
| 2511.10 | Barytes   | 3,070  | 2,684 | 5,533             | 2,280   | 2,396 | 2,921             |
| 2511.20 | Witherite | –      | –     | –                 | –       | –     | –                 |

## Imports

| H.S.    | Commodity | tonnes  |         |                   | RM '000 |        |                   |
|---------|-----------|---------|---------|-------------------|---------|--------|-------------------|
|         |           | 2012    | 2013    | 2014 <sup>P</sup> | 2012    | 2013   | 2014 <sup>P</sup> |
| 2511.10 | Barytes   | 137,747 | 156,198 | 85,837            | 69,816  | 98,886 | 60,141            |
| 2511.20 | Witherite | 830     | 851     | 33                | 171     | 171    | 42                |

Source: Department of Statistics

## Malaysia's imports of barytes, by country

67

| Country                                   | 2012              |                   | 2013              |                   | 2014 <sup>P</sup> |                   |
|---|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|   | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        |
| <i>Barytes</i><br>(HS: 2511.10 & 2511.20) |                   |                   |                   |                   |                   |                   |
| Vietnam                                   | 14,499            | 7,276,815         | 21,446            | 13,658,782        | 48,853            | 30,713,294        |
| Thailand                                  | 2,658             | 2,301,143         | 6,533             | 5,675,784         | 22,135            | 15,054,901        |
| China                                     | 65,728            | 31,001,864        | 23,973            | 16,673,332        | 5,783             | 6,593,183         |
| India                                     | 53,560            | 27,928,550        | 101,850           | 57,223,029        | 6,353             | 3,491,737         |
| Singapore                                 | -                 | -                 | 1,436             | 2,058,613         | 1,828             | 2,478,193         |
| Others                                    | 2,132             | 1,478,937         | 1,811             | 3,767,418         | 917               | 1,851,485         |
| <b>Total</b>                              | <b>138,577</b>    | <b>69,987,309</b> | <b>157,049</b>    | <b>99,056,958</b> | <b>85,869</b>     | <b>60,182,793</b> |

Source: Department of Statistics

## Price (per tonne)

| Grade  | 2011  | 2012  | 2013  | 2014  |
|--|---|---|---|---|
| <b>Paint grade</b> , Ground white 96-98% BaSO <sub>4</sub> , 350 mesh, 1-5 lots, del. UK, per tonnes   | £195-220  | £195-220  | £195-220  | £195-220  |
| <b>Paint grade</b> , Chinese lump, CIF Gulf Coast  | USD240-260                                      | USD235-290                                      | USD235-275                                      | USD235-275                                      |
| <b>Drilling grade</b> , Unground lump, OCMA/API bulk, SG 4.2 FOB Chennai   | USD142-146                                      | USD140-145                                      | USD140-155                                      | USD135-150                                      |
| <b>Drilling grade</b> , Ground, OCMA/API big bags (1.5 tonnes) SG 4.22, bagged, FOB Morocco<br>FOB S.Turkey<br>OCMA bulk, del. Aberdeen<br>OCMA bulk, del. Gt Yarmouth | USD135-147<br>USD130-135<br>£95-105<br>£110-120 | USD135-147<br>USD150-155<br>£95-105<br>£110-120 | USD110-170<br>USD150-155<br>£95-105<br>£110-120 | USD150-155<br>USD110-170<br>£95-105<br>£110-120 |
| <b>Drilling grade</b> , API, CIF Gulf Coast, Chinese<br>Indian   | USD136-150<br>USD165-170                        | USD158-162<br>USD157-171                        | USD147-154<br>USD157-171                        | USD147-154<br>USD157-171                        |

Source: Industrial Minerals April 2014

## World mine production of barytes

68

| Country                      | tonnes       |              |                   | % of 2014 <sup>P</sup> |
|------------------------------|--------------|--------------|-------------------|------------------------|
|                              | 2012         | 2013         | 2014 <sup>P</sup> |                        |
| China                        | 4,200        | 4,000        | 4,100             | 44.28                  |
| India                        | 1,700        | 1,740        | 1,600             | 17.28                  |
| Morocco                      | 1,000        | 1,000        | 1,000             | 10.80                  |
| United States                | 666          | 700          | 720               | 7.78                   |
| Iran                         | 330          | 270          | 270               | 2.92                   |
| Turkey                       | 260          | 250          | 270               | 2.92                   |
| Kazakhstan                   | 250          | 250          | 250               | 2.70                   |
| Mexico                       | 140          | 344          | 400               | 4.75                   |
| Pakistan                     | 52           | 118          | 75                | 0.81                   |
| Other countries              | 599          | 558          | 575               | 6.21                   |
| <b>World total (rounded)</b> | <b>9,200</b> | <b>9,230</b> | <b>9,260</b>      |                        |

Source: United States Geological Survey

## Review

The main minerals of barium are barytes ( $\text{BaSO}_4$ ) and witherite ( $\text{BaCO}_3$ ). However, only barytes is mined in Malaysia. Barytes is a soft and inert mineral with a high density. Its physical character is suitable as a weighing agent (drilling muds) in oil and gas exploration to help confine high oil and gas pressures. Approximately about 80% to 85% of the world's barytes is used in the petroleum industry as one of the key ingredients in drilling mud for oil and gas wells. It is also used in the paint and coating industry as well as in the automotive industry.

In 2014, there was no barytes production in the country. For the domestic consumption, a total of 85,869 tonnes of barytes valued at RM60.18 million

was imported in 2014 compared with 157,049 tonnes valued at RM99.06 million in the previous year. Most of the barytes was imported from Vietnam, Thailand, India, China and Singapore. The imported barytes was processed by BCI Sabah International Petroleum Sdn. Bhd. (formerly known as Trenggo Minerals Sdn. Bhd.) and Scomi Oil Tools Sdn. Bhd. located in Terengganu to produce crushed and ground barytes.

About 105,000 tonnes of barytes resources have been identified in Malaysia. These resources are located in Sungai Perdah, Bukit PENCHURI, Ulu Sokor and Sungai Mangkok in Kelantan; Tasik Chini, Sungai Mentiga and Bukit Ibam in Pahang; and in Gerik, Perak. ■

## BENTONITE/FULLER'S EARTH

### External Trade

#### Exports

| H.S.        | Commodity      | tonnes |       |                   | RM '000 |       |                   |
|-------------|----------------|--------|-------|-------------------|---------|-------|-------------------|
|             |                | 2012   | 2013  | 2014 <sup>P</sup> | 2012    | 2013  | 2014 <sup>P</sup> |
| 2508.10.000 | Bentonite      | 14,648 | 6,221 | 1,140             | 11,977  | 8,672 | 1,707             |
| 2508.40.110 | Fuller's earth | 320    | 20    | 2,124             | 253     | 21    | 2,019             |

#### Imports

| H.S.        | Commodity      | tonnes |        |                   | RM '000 |        |                   |
|-------------|----------------|--------|--------|-------------------|---------|--------|-------------------|
|             |                | 2012   | 2013   | 2014 <sup>P</sup> | 2012    | 2013   | 2014 <sup>P</sup> |
| 2508.10.000 | Bentonite      | 24,058 | 38,508 | 67,935            | 51,144  | 50,753 | 57,516            |
| 2508.20.110 | Fuller's earth | 55,242 | 61,916 | 38,466            | 30,976  | 31,868 | 50,922            |

#### Malaysia's exports of bentonite, by country

| Country                            | 2012              |                   | 2013              |                  | 2014 <sup>P</sup> |                  |
|------------------------------------|-------------------|-------------------|-------------------|------------------|-------------------|------------------|
|                                    | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)       |
| <i>Bentonite (HS: 2508.10.000)</i> |                   |                   |                   |                  |                   |                  |
| Indonesia                          | 13,966            | 10,736,061        | 4,770             | 7,713,329        | 605               | 966,624          |
| Philippines                        | 50                | 20,550            | 690               | 333,019          | 208               | 289,372          |
| Singapore                          | 110               | 99,559            | 377               | 269,724          | 131               | 154,854          |
| China                              | -                 | -                 | -                 | -                | 18                | 115,735          |
| Myanmar                            | 23                | 6,413             | -                 | -                | 106               | 57,529           |
| Others                             | 499               | 1,114,792         | 384               | 356,215          | 72                | 122,487          |
| <b>Total</b>                       | <b>14,648</b>     | <b>11,977,375</b> | <b>6,221</b>      | <b>8,672,287</b> | <b>1,140</b>      | <b>1,706,601</b> |

#### Malaysia's imports of bentonite, by country

| Country                            | 2012              |                   | 2013              |                   | 2014 <sup>P</sup> |                   |
|------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|                                    | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        |
| <i>Bentonite (HS: 2508.10.000)</i> |                   |                   |                   |                   |                   |                   |
| India                              | 10,341            | 21,084,876        | 21,718            | 21,828,366        | 23,593            | 14,159,673        |
| China                              | 5,233             | 10,598,509        | 4,751             | 9,554,682         | 7,326             | 13,464,616        |
| USA                                | 3,129             | 5,826,717         | 4,588             | 6,408,327         | 3,022             | 8,935,376         |
| Greece                             | -                 | -                 | -                 | -                 | 28,215            | 8,101,372         |
| Australia                          | 555               | 6,876,069         | 952               | 5,333,942         | 657               | 4,361,304         |
| Others                             | 4,799             | 6,758,015         | 6,500             | 7,627,513         | 5,122             | 8,494,134         |
| <b>Total</b>                       | <b>24,058</b>     | <b>51,144,186</b> | <b>38,508</b>     | <b>50,752,830</b> | <b>67,935</b>     | <b>57,516,475</b> |

Source: Department of Statistics



## Malaysia's exports of Fuller's earth, by country

| Country                                    | 2012              |                | 2013              |               | 2014 <sup>p</sup> |                  |
|--|-------------------|----------------|-------------------|---------------|-------------------|------------------|
|  | Quantity (tonnes) | Value (RM)     | Quantity (tonnes) | Value (RM)    | Quantity (tonnes) | Value (RM)       |
| <i>Fuller's earth</i><br>(HS: 2508.40.110) |                   |                |                   |               |                   |                  |
| Indonesia                                  | -                 | -              | -                 | -             | 2,000             | 1,906,234        |
| Singapore                                  | -                 | -              | -                 | -             | 104               | 88,931           |
| Taiwan                                     | 40                | 38,101         | 20                | 21,019        | 20                | 24,101           |
| Others                                     | 280               | 214,727        | -                 | -             | -                 | -                |
| <b>Total</b>                               | <b>320</b>        | <b>252,828</b> | <b>20</b>         | <b>21,019</b> | <b>2,124</b>      | <b>2,019,266</b> |

## Malaysia's imports of Fuller's earth, by country

| Country                                    | 2012              |                   | 2013              |                   | 2014 <sup>p</sup> |                   |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|  | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        |
| <i>Fuller's earth</i><br>(HS: 2508.40.100) |                   |                   |                   |                   |                   |                   |
| India                                      | 22,268            | 14,695,570        | 46,585            | 22,646,859        | 23,483            | 42,168,521        |
| China                                      | 32,974            | 16,280,132        | 15,329            | 9,215,047         | 14,828            | 8,580,762         |
| USA  | -                 | -                 | -                 | -                 | 43                | 79,380            |
| Others                                     | -                 | -                 | 1                 | 6,069             | 112               | 93,213            |
| <b>Total</b>                               | <b>55,242</b>     | <b>30,975,702</b> | <b>61,916</b>     | <b>31,867,975</b> | <b>38,466</b>     | <b>50,921,876</b> |

Source: Department of Statistics

## Price (per tonne unless indicated)

| Grade   | 2011        | 2012        | 2013        | 2014        |
|---|-------------|-------------|-------------|-------------|
| <b><u>Bentonite</u></b>   |             |             |             |             |
| Foundry grade, bagged, railcars, ex-works Wyoming, per s.ton        | USD78 - 120 | USD97 - 124 | USD97 - 124 | USD97 - 124 |
| API grade, bagged rail-cars, ex-works Wyoming, per s.ton            | USD90       | USD90 - 130 | USD90 - 130 | USD90 - 130 |
| Cat litter, grade 1-5 mm, bulk, FOB main European port              | €42 - 60    | €42 - 60    | €42 - 60    | €42 - 60    |
| Indian, cat litter grade, crushed, dried, loose in bulk, FOB Kandla | USD34 - 38  | USD34 - 38  | USD34 - 38  | USD34 - 38  |
| OCMA/Foundry grade, crude & dried bulk, FOB Milos                   | €50 - 75    | €60 - 80    | €60 - 80    | €60 - 80    |

Source: Industrial Minerals April 2014

## World mine production of bentonite

| Country                      | tonnes        |               |                   | % of 2014 <sup>P</sup> |
|------------------------------|---------------|---------------|-------------------|------------------------|
|                              | 2012          | 2013          | 2014 <sup>P</sup> |                        |
| USA (sales)                  | 4,980         | 4,350         | 4,660             | 65.94                  |
| Greece (crude)               | 800           | 1,000         | 1,000             | 8.20                   |
| Brazil (beneficiated)        | 567           | 513           | 500               | 4.10                   |
| Turkey                       | 400           | 1,100         | 1,100             | 9.02                   |
| Germany (sales)              | 375           | 375           | 350               | 2.87                   |
| Ukraine (crude)              | 210           | 210           | 180               | 1.48                   |
| Czech Republic (crude)       | 221           | 226           | 230               | 1.89                   |
| Spain                        | 115           | 115           | 100               | 0.82                   |
| Italy                        | 110           | 110           | 100               | 0.82                   |
| Mexico                       | 54            | 618           | 620               | 5.08                   |
| Other countries              | 2,100         | 3,385         | 3,325             | 27.25                  |
| <b>World total (rounded)</b> | <b>11,300</b> | <b>12,000</b> | <b>12,200</b>     |                        |

Source: United States Geological Survey

## World mine production of Fuller's earth

| Country                      | tonnes       |               |                   | % of 2014 <sup>P</sup> |
|------------------------------|--------------|---------------|-------------------|------------------------|
|                              | 2012         | 2013          | 2014 <sup>P</sup> |                        |
| USA (sales)                  | 1,980        | *1,990        | *2,070            | *69.00                 |
| Spain                        | 591          | 593           | 590               | 19.67                  |
| Mexico                       | 108          | 108           | 100               | 3.33                   |
| Italy                        | 3            | 3             | 3                 | 0.10                   |
| Other countries              | 299          | 306           | 270               | 9.00                   |
| <b>World total (rounded)</b> | <b>2,980</b> | <b>*3,000</b> | <b>*3,000</b>     |                        |

\* Excludes attapulgite  
Source: United States Geological Survey

## Review

Bentonite is a soft, plastic, porous, light-coloured rock composed essentially of clay minerals of the montmorillonite (smectite) group and colloidal silica. It is produced by the devitrification and accompanying chemical alteration of a glassy igneous material, usually tuff or volcanic ash. It varies in composition and is usually highly colloidal and plastic.

Generally, it is graded by the following properties: the cation exchange capacities (C.E.C); the ratio of individual cations such as sodium, calcium and magnesium; the potential for this ratio to be altered; and the ratio of ferrous to ferric iron composition.

Bentonite has many uses, which depends upon its mineralogical composition and technological properties. It is mostly used in the foundry industry, for pelletizing of iron ores, as adsorbents in drilling muds, as fillers and suspension in the building industry, in agriculture, pet waste absorbents and as food binders.

Fuller's earth is a collective term for clay and fine-grained earthy material characterised mainly by their adsorbent properties. The principal clay minerals are attapulgite and sepiolite. It is used for decolourising and purifying mineral, vegetable and animal oils.

Currently, there is no production of bentonite and fuller's earth in Malaysia. Hence, Malaysia imports both bentonite and fuller's earth to cater for local demands used mainly in the drilling muds, oil bleaches and palm oil refining industries.

In 2014, Malaysia imports increased to 67,935 tonnes of bentonite valued at RM57.52 million compared with 38,508 tonnes valued at RM50.75 million in 2013. Imports of fuller's earth decreased to 38,466 tonnes valued at RM50.92 million compared to 61,916 tonnes valued at RM31.87 million in the previous year. Most of the bentonite and fuller's earth were imported from India and China. The imported bentonite was processed to produce activated clay by five processing plants located two in Selangor and one each in Perak, Johor and Sabah. Although bentonite and fuller's earth were not produced in Malaysia, a total of 1,140 tonnes of bentonite valued at RM1.71 million were exported mostly to Indonesia, Philippines, Singapore, Myanmar and China in 2014. In the same year, fuller's earth with a total of 2,124 tonnes valued at RM2.02 million were exported mainly to Indonesia, Singapore and Taiwan. ■

## CLAYS

### Malaysia's production of clays

| State           | 2011              |              | 2012              |              | 2013              |              | 2014              |              |
|-----------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
|                 | tonnes            | producers    | tonnes            | producers    | tonnes            | producers    | tonnes            | producers    |
| Perak           | 6,583,650         | 194          | 6,009,222         | 196          | 6,388,740         | 180          | 4,758,000         | 197          |
| Johor           | 5,273,097         | 185          | 5,812,005         | 203          | 6,176,076         | 203          | 7,685,896         | 179          |
| Terengganu      | 2,865,341         | 303          | 4,184,807         | 371          | 3,206,454         | 333          | 2,537,641         | 320          |
| Kedah           | 2,799,617         | 160          | 3,139,414         | 149          | 3,188,546         | 127          | 4,881,254         | 144          |
| Selangor / KL   | 2,915,053         | 93           | 4,073,695         | 119          | 2,785,982         | 116          | 1,244,729         | 113          |
| Sarawak         | 2,916,091         | 134          | 1,531,567         | 119          | 1,837,484         | 131          | 1,810,000         | 131          |
| Perlis          | 1,506,557         | 17           | 1,830,316         | 18           | 1,739,273         | 13           | 2,424,819         | 15           |
| Negeri Sembilan | 1,036,335         | 121          | 1,104,138         | 126          | 1,546,970         | 153          | 2,078,127         | 155          |
| Pahang          | 1,198,094         | 94           | 1,191,588         | 112          | 1,430,415         | 136          | 2,088,530         | 136          |
| Melaka          | 750,630           | 184          | 1,092,529         | 188          | 737,842           | 150          | 569,799           | 121          |
| Sabah           | 365,636           | 12           | 452,929           | 13           | 561,061           | 15           | 565,000           | 17           |
| Kelantan        | 135,018           | 56           | 224,361           | 61           | 197,642           | 66           | 212,687           | 62           |
| Pulau Pinang    | 38,600            | 4            | 43,380            | 3            | 34,420            | 3            | 11,000            | 2            |
| <b>Total</b>    | <b>28,383,719</b> | <b>1,557</b> | <b>30,689,951</b> | <b>1,678</b> | <b>29,830,904</b> | <b>1,626</b> | <b>30,867,482</b> | <b>1,592</b> |

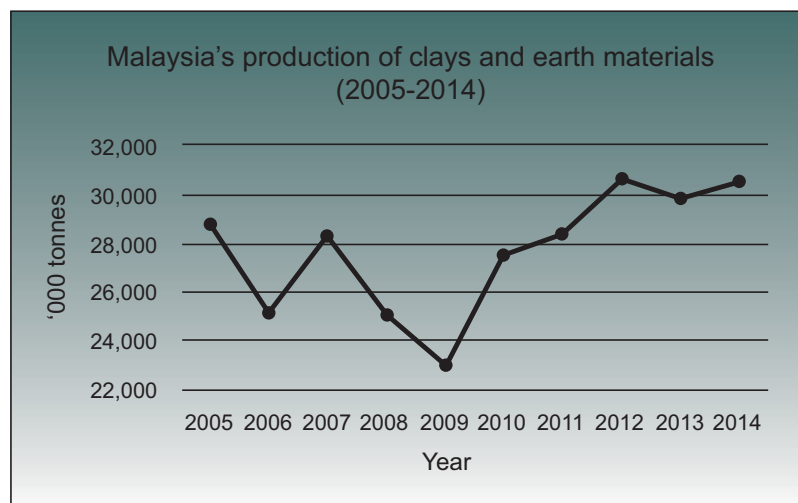
Source: Minerals and Geoscience Department Malaysia

74

\* Estimated

### Malaysia's historic production of clays and earth materials

| Year | '000 tonnes |
|------|-------------|
| 2005 | 28,758      |
| 2006 | 25,081      |
| 2007 | 28,292      |
| 2008 | 25,065      |
| 2009 | 22,966      |
| 2010 | 27,543      |
| 2011 | 28,384      |
| 2012 | 30,690      |
| 2013 | 29,831      |
| 2014 | 30,867      |



## Exports

| H.S.                                      | Commodity   | tonnes  |         |                   | RM '000 |        |                   |
|---|-------------|---------|---------|-------------------|---------|--------|-------------------|
|   |             | 2012    | 2013    | 2014 <sup>P</sup> | 2012    | 2013   | 2014 <sup>P</sup> |
| 2508.30.000                               | Fire-clay   | 860     | 21,963  | 27,018            | 286     | 7,453  | 9,119             |
| 2508.40.110<br>2508.40.120<br>2508.40.900 | Other clays | 161,424 | 183,322 | 312,669           | 17,478  | 25,768 | 46,144            |

## Imports

| H.S.                                      | Commodity   | tonnes |        |                   | RM '000 |        |                   |
|---|-------------|--------|--------|-------------------|---------|--------|-------------------|
|   |             | 2012   | 2013   | 2014 <sup>P</sup> | 2012    | 2013   | 2014 <sup>P</sup> |
| 2508.30.000                               | Fire-clay   | 1,839  | 8,379  | 17,473            | 2,195   | 5,735  | 19,908            |
| 2508.40.110<br>2508.40.120<br>2508.40.900 | Other clays | 85,222 | 87,064 | 74,325            | 62,153  | 64,102 | 91,941            |

## Malaysia's exports of clays by country

| Country  | 2012              |                   | 2013              |                   | 2014 <sup>P</sup> |                   |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|  | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        |
| <i>Clays &amp; others refractory minerals (SITC: 2508)</i> |                   |                   |                   |                   |                   |                   |
| Bangladesh   | 91,241            | 7,759,275         | 123,833           | 18,986,671        | 178,949           | 23,995,766        |
| Indonesia  | 22,931            | 7,281,704         | 23,947            | 8,212,515         | 36,372            | 21,611,682        |
| UAE  | 28,619            | 835,025           | 35,770            | 2,684,053         | 83,319            | 4,833,160         |
| Taiwan   | 11                | 23,798            | -                 | -                 | 20,299            | 1,301,938         |
| Thailand   | 542               | 272,455           | 860               | 496,455           | 989               | 545,291           |
| Others   | 18,776            | 1,433,648         | 20,943            | 2,975,624         | 17,829            | 1,273,747         |
| <b>Total</b>   | <b>162,119</b>    | <b>17,605,905</b> | <b>205,353</b>    | <b>33,355,318</b> | <b>337,758</b>    | <b>53,561,584</b> |

75

## Malaysia's imports of clays by country

| Country  | 2012              |                   | 2013              |                   | 2014 <sup>P</sup> |                   |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|  | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        |
| <i>Clays &amp; others refractory minerals (HS: 2508)</i> |                   |                   |                   |                   |                   |                   |
| China  | 19,355            | 16,939,621        | 17,268            | 18,696,919        | 23,677            | 38,006,060        |
| Thailand   | 6,051             | 4,979,211         | 6,890             | 7,339,910         | 15,360            | 11,153,416        |
| India  | 806               | 2,022,495         | 1,589             | 2,478,412         | 1,732             | 4,191,783         |
| Taiwan   | 589               | 876,550           | 455               | 643,323           | 1,494             | 2,685,006         |
| USA  | 2,351             | 3,127,430         | 1,865             | 3,330,337         | 1,564             | 2,385,585         |
| Others   | 5,498             | 8,065,146         | 8,914             | 9,323,396         | 15,601            | 7,662,298         |
| <b>Total</b>   | <b>34,650</b>     | <b>36,411,892</b> | <b>36,981</b>     | <b>41,812,297</b> | <b>59,428</b>     | <b>66,084,148</b> |

Source: Department of Statistics

## Price (per tonne)

| Grade  | 2011       | 2012       | 2013       | 2014       |
|--|------------|------------|------------|------------|
| <b>Refractory Clays/Mullite</b>  |            |            |            |            |
| Chinese flintclay, 45% Al <sub>2</sub> O <sub>3</sub> , per tonne FOB China            | N.A        | N.A        | N.A        |            |
| European calcined kaolinitic clay, 47% Al <sub>2</sub> O <sub>3</sub> , FOB, per tonne | N.A<br>N.A | N.A<br>N.A | N.A<br>N.A | N.A<br>N.A |
| Mulcoa products, 47% (sized in bulk bags) for coarse sizing, FOB USA, short tonne      | USD198     | USD198     | USD198     | USD198     |

Source: Industrial Minerals April 2014

## Review

The term 'clays' is used in various ways. Clays include common clay, ball clay, fire clay, shale and earth materials such as laterite, earth and red earth. The ceramics industry is the largest consumer of clays. Locally produced clays are primarily used in making bricks, ceramics, cement, as well as for landfill. The main ball clay products are floor and wall tiles, pottery and sanitaryware. In addition, common clay is usually used in the manufacture of heavy clay products such as building bricks, sewer pipes, structural tiles and terra cotta. Shale and common clay are used in the making of clinker. Fire clay is used in refractory products such as firebricks and blocks and high alumina bricks.

Malaysia has abundant clay resources estimated at 685 million tonnes (Mt) which includes ball clay resources of about 377 Mt. Major deposits of ball clay are found in the eastern part of the Peninsular Malaysia located mostly in Terengganu (151 Mt), Johor (128 Mt), Kelantan (103 Mt) and Pahang (94 Mt). The rest are in Selangor, Sarawak, Pulau Pinang, Negeri Sembilan, Kedah and Perak.

In 2014, there were 1,592 clays and earth materials producers operating during the year, of which 1,437 were earth materials and the rest, include clays and shale. The highest number of producers were reported in the state of Terengganu with 320 producers, Perak (197), followed by Johor (179), Negeri Sembilan (155) and Kedah (144).

During the year, the total production of clays and earth materials was slightly increased by 3.6% to 30.87 Mt compared to 29.8 Mt in the previous year. The largest production was in Johor with amount of 7.7 Mt followed by Kedah (4.9 Mt), Perak (4.8 Mt), Terengganu (2.5 Mt), Perlis (2.4 Mt) and Pahang (2 Mt).

The production of clay and earth materials for the year 2014 increased slightly by 3.6 percent to 30.9 million tonnes valued at RM261.8 million from 29.8 million tonnes valued at RM254.3 million in 2013.

Clay production increased by 30.0 percent to 7.8 million tonnes in 2014 compared to 6.0 million tonnes in 2013. Earth materials production decreased by 3.4 percent to 23.0 million tonnes in 2014 compared to 23.8 million tonnes in 2013.

During 2014, Malaysia exported a total of 337,758 tonnes of clays worth RM53.6 million compared with 205,353 tonnes worth RM33.4 million in the previous year. The clays were exported mainly to Bangladesh, Indonesia, UAE, Taiwan and Thailand. At the same time, Malaysia also imported a total of 59,428 tonnes of clays worth RM66.1 million compared with 36,981 tonnes worth RM41.8 million in 2013. The major sources of imported clays were China, Thailand, India, Taiwan and USA. ■

## FELDSPAR

### Malaysia's production of feldspar

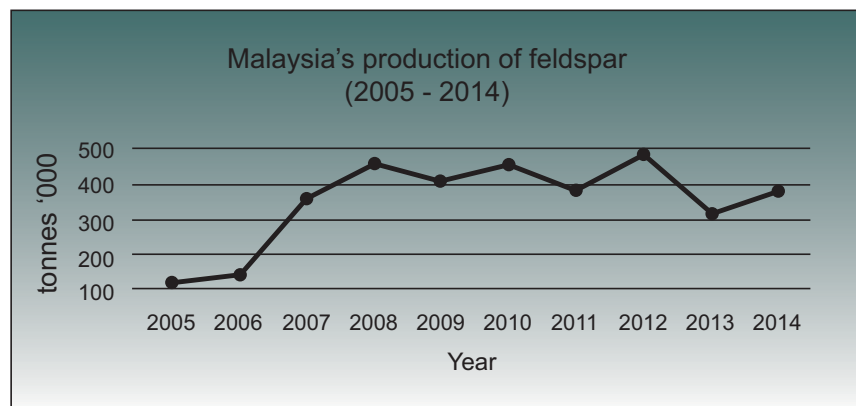
| State        | 2011           |          | 2012           |          | 2013           |          | 2014             |          |
|--------------|----------------|----------|----------------|----------|----------------|----------|------------------|----------|
|              | tonnes         | mines    | tonnes         | mines    | tonnes         | mines    | tonnes           | mines    |
| Kelantan     | 322,029        | 3        | 456,746        | 3        | 277,061        | 3        | 1,189,947        | 3        |
| N. Sembilan  | 57,600         | 6        | 26,160         | 6        | 37,338         | 2        | 12,780           | 2        |
| <b>Total</b> | <b>379,629</b> | <b>9</b> | <b>482,906</b> | <b>9</b> | <b>314,399</b> | <b>5</b> | <b>1,202,727</b> | <b>5</b> |

Source: Minerals and Geoscience Department Malaysia

### Malaysia's historic production (feldspar)

| Year | tonnes    |
|------|-----------|
| 2005 | 117,180   |
| 2006 | 142,358   |
| 2007 | 358,585   |
| 2008 | 457,377   |
| 2009 | 410,053   |
| 2010 | 455,497   |
| 2011 | 379,629   |
| 2012 | 482,906   |
| 2013 | 314,399   |
| 2014 | 1,202,727 |

Source: Minerals and Geoscience Department Malaysia



## External Trade

## Exports

| H.S.        | Commodity                                 | tonnes |        |                   | RM '000 |       |                   |
|-------------|---|--------|--------|-------------------|---------|-------|-------------------|
|             |   | 2012   | 2013   | 2014 <sup>P</sup> | 2012    | 2013  | 2014 <sup>P</sup> |
| 2529.10.100 | Potash feldspar,<br>Soda feldspar         | 11,695 | 13,740 | 15,392            | 5,949   | 6,626 | 6,090             |
| 2529.10.900 | Other feldspar                            | –      | –      | 40                | –       | –     | 8                 |
| 2529.30.000 | Leucite; Nepheline<br>& Nepheline syenite | 285    | 214    | 246               | 379     | 256   | 332               |

## Imports

| H.S.        | Commodity                                 | tonnes  |        |                   | RM '000 |        |                   |
|-------------|---|---------|--------|-------------------|---------|--------|-------------------|
|             |   | 2012    | 2013   | 2014 <sup>P</sup> | 2012    | 2013   | 2014 <sup>P</sup> |
| 2529.10.100 | Potash feldspar,<br>Soda feldspar         | 141,040 | 66,814 | 78,264            | 69,117  | 26,638 | 22,558            |
| 2529.10.900 | Other feldspar                            | 20,500  | 7,385  | 43,035            | 7,254   | 3,829  | 12,786            |
| 2529.30.000 | Leucite: Nepheline<br>& Nepheline syenite | 3,274   | 3,109  | 3,648             | 10,978  | 13,899 | 18,190            |

78

## Malaysia's exports of feldspar, by country

| Country                    | 2012                 |                   | 2013                 |                   | 2014 <sup>P</sup>    |                   |
|----------------------------|----------------------|-------------------|----------------------|-------------------|----------------------|-------------------|
|                            | Quantity<br>(tonnes) | Value<br>(RM)     | Quantity<br>(tonnes) | Value<br>(RM)     | Quantity<br>(tonnes) | Value<br>(RM)     |
| <i>Feldspar (HS: 2529)</i> |                      |                   |                      |                   |                      |                   |
| Japan                      | 3,769                | 4,484,509         | 3,182                | 4,081,580         | 2,948                | 3,780,961         |
| Bangladesh                 | 7,430                | 973,018           | 9,934                | 1,577,146         | 12,315               | 2,132,932         |
| Singapore                  | 3,137                | 1,460,150         | 2,663                | 1,510,811         | 2,716                | 1,657,414         |
| Thailand                   | 1,695                | 1,097,084         | 2,581                | 2,808,724         | 2,231                | 1,503,515         |
| Vietnam                    | 3,051                | 1,512,847         | 1,653                | 945,044           | 2,501                | 1,434,691         |
| Others                     | 15,899               | 5,305,868         | 12,017               | 5,208,495         | 2,272                | 1,394,245         |
| <b>Total</b>               | <b>34,981</b>        | <b>14,833,476</b> | <b>32,030</b>        | <b>16,131,800</b> | <b>24,984</b>        | <b>11,903,758</b> |

Source: Department of Statistics



## Malaysia's imports of feldspar, by country

| Country                    | 2012              |                   | 2013              |                   | 2014 <sup>P</sup> |                   |
|----------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|                            | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        |
| <i>Feldspar (HS: 2529)</i> |                   |                   |                   |                   |                   |                   |
| Netherlands                | 96                | 466,536           | 550               | 2,640,713         | 3,079             | 15,744,751        |
| Thailand                   | 37,302            | 7,906,732         | 10,111            | 8,125,795         | 49,504            | 12,183,575        |
| China                      | 20,426            | 14,863,865        | 42,319            | 13,819,657        | 42,110            | 10,547,390        |
| India                      | 23,011            | 7,126,199         | 15,746            | 4,810,808         | 22,106            | 6,916,418         |
| Turkey                     | 8,926             | 4,476,971         | 5,142             | 2,717,586         | 6,069             | 3,611,969         |
| Others                     | 75,053            | 33,420,616        | 3,439             | 12,251,237        | 2,079             | 4,529,885         |
| <b>Total</b>               | <b>164,814</b>    | <b>68,260,919</b> | <b>77,308</b>     | <b>44,365,796</b> | <b>124,947</b>    | <b>53,533,988</b> |

Source: Department of Statistics

## Price (per tonne)

| Grade  | 2011       | 2012         | 2013         | 2014         |
|--|------------|--------------|--------------|--------------|
| <b>Ex-works, USA, per s/ton, bulk</b>                                    |            |              |              |              |
| Ceramic grade  |            |              |              |              |
| 170-200 mesh, (Na)   | N.A        | USD150 - 180 | USD150 - 180 | USD150 - 180 |
| 325 mesh, bagged (Na)  | N.A        | N.A          | N.A          | N.A          |
| 200 mesh (K)   | N.A        | N.A          | N.A          | N.A          |
| Glass grade  |            |              |              |              |
| 30 mesh (Na)   | N.A        | N.A          | N.A          | N.A          |
| 80 mesh (K)  | N.A        | N.A          | N.A          | N.A          |
| Turkish, Na feldspar, Crude<br>- 10 mm size bulk, FOB Gulluk             | USD22 - 23 | USD22 - 23   | USD22 - 23   | USD22 - 23   |
| Turkish, Na feldspar, Glass grade,<br>- 500 microns, bagged, FOB Gulluk, | \$70       | \$70         | \$70         | \$70         |
| <b>South Africa, FOB Durban, bagged</b>                                  |            |              |              |              |
| Ceramic grade  | N.A        | USD168       | USD168       | USD168       |
| Micronised (2, 5, 10 microns)  | N.A        | N.A          | N.A          | N.A          |

Source: Industrial Minerals April 2014

## World mine production of feldspar

| Country                      | tonnes        |               |                   | % of 2014 <sup>P</sup> |
|------------------------------|---------------|---------------|-------------------|------------------------|
|                              | 2012          | 2013          | 2014 <sup>P</sup> |                        |
| Turkey                       | 7,100         | 5,000         | 5,000             | 23.23                  |
| Italy                        | 4,700         | 4,700         | 4,700             | 21.84                  |
| China                        | 2,100         | 2,100         | 2,100             | 9.76                   |
| Thailand                     | 1,100         | 1,100         | 1,100             | 5.11                   |
| France                       | 650           | 650           | 650               | 3.02                   |
| Iran                         | 500           | 580           | 600               | 2.79                   |
| Japan                        | 600           | 105           | 100               | 0.46                   |
| Spain                        | 510           | 530           | 530               | 2.46                   |
| India                        | 500           | 1,200         | 1,300             | 6.04                   |
| Poland                       | 510           | 380           | 400               | 1.86                   |
| USA**                        | 525           | 550           | 560               | 2.60                   |
| Czech Republic               | 445           | 450           | 440               | 2.04                   |
| Egypt                        | 400           | 400           | 400               | 1.86                   |
| ROK                          | 400           | 350           | 350               | 1.63                   |
| Malaysia*                    | 483           | 450           | 350               | 1.63                   |
| Other countries              | 2,287         | 2,612         | 2,943             | 13.67                  |
| <b>World total (rounded)</b> | <b>22,700</b> | <b>21,157</b> | <b>21,523</b>     |                        |

Source: United States Geological Survey  
 \* - Revised figures based on actual production  
 \*\* - Estimated. E Net exporter

## Review

Feldspar is the most abundant component mineral in igneous rocks, comprising a group of aluminosilicate minerals combined in variable proportions with lime, soda or potash. There are four types of feldspar, however, only potassium and sodium feldspar have economic interest and are used in the glass and ceramic industries or used as mild abrasives. Feldspar is also used in plastics, paints and rubber industries. In ceramics, feldspar is used as a flux to reduce vitrifying temperatures during firing and formation of glassy phases. In glass making, feldspar provides alumina for improving hardness, durability and resistance to chemical erosion.

The total feldspar production during the year was 1,202,727 tonnes, increasing as much as 282.5% from 314,399 tonnes produced in the previous year. The feldspar was produced from three feldspar-rich rock producers operating at Tanah Putih, Gua Musang, Kelantan and one in Gemencheh, Negeri Sembilan.

In 2014, imports of feldspar amounted to 124,947 tonnes valued at RM53.53 million. The imported

feldspar mainly came from Netherlands, Thailand, China, India and Turkey. During the year, Malaysia also exported a total of 24,984 tonnes of feldspar worth RM11.90 million. The main export destinations were Bangladesh, Japan, Singapore, Vietnam and Thailand.

The Minerals and Geoscience Department has identified sodium rich feldspar deposits in Gua Musang, Kelantan and in Merapoh, Pahang and high potassium feldspar volcanic rocks in Gerik, Perak. Another local source of feldspar are the quartz-sericite rocks (locally known as pottery stone), which is quarried in Gemencheh, Negeri Sembilan. Besides these, the pegmatite and graphic granites at Bukit Mor in Johor and Tanjung Jaga in Kedah and leucogranites in Gunung Pulai, Johor are also possible as new sources for feldspar.

In 2014, the Minerals and Geoscience Department has carried out evaluation of feldspar covering an area of 98 km<sup>2</sup> in Perak and Sarawak. ■

## GYPSUM AND ANHYDRITE

### Exports

| H.S.        | Commodity             | tonnes |       |                   | RM '000 |       |                   |
|-------------|-----------------------|--------|-------|-------------------|---------|-------|-------------------|
|             |                       | 2012   | 2013  | 2014 <sup>P</sup> | 2012    | 2013  | 2014 <sup>P</sup> |
| 2520.10.000 | Gypsum: Anhydrite     | 3,438  | 3,921 | 5,526             | 669     | 1,187 | 585               |
| 2520.20.100 | Plasters of dentistry | –      | –     | –                 | –       | –     | –                 |
| 2520.20.900 | Other plaster         | 6,570  | 6,857 | 5,992             | 4,680   | 6,579 | 6,566             |

### Imports

| H.S.        | Commodity             | tonnes  |         |                   | RM '000 |         |                   |
|-------------|-----------------------|---------|---------|-------------------|---------|---------|-------------------|
|             |                       | 2012    | 2013    | 2014 <sup>P</sup> | 2012    | 2013    | 2014 <sup>P</sup> |
| 2520.10.000 | Gypsum: Anhydrite     | 507,199 | 343,081 | 319,487           | 105,235 | 103,659 | 105,756           |
| 2520.20.100 | Plasters of dentistry | 89      | 85      | 126               | 182     | 197     | 241               |
| 2520.20.900 | Other plaster         | 217,399 | 93,641  | 182,703           | 52,978  | 53,949  | 61,984            |

### Malaysia's exports of gypsum, by country

| Country                         | 2012              |                | 2013              |                  | 2014 <sup>P</sup> |                |
|---------------------------------|-------------------|----------------|-------------------|------------------|-------------------|----------------|
|                                 | Quantity (tonnes) | Value (RM)     | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)     |
| <i>Gypsum (HS: 2520.10.000)</i> |                   |                |                   |                  |                   |                |
| Indonesia                       | 3,000             | 297,000        | 3,690             | 823,864          | 5,500             | 550,000        |
| China                           | -                 | -              | -                 | -                | 1                 | 14,093         |
| Australia                       | -                 | -              | -                 | -                | 12                | 10,408         |
| New Zealand                     | -                 | -              | -                 | -                | 13                | 10,195         |
| Egypt                           | 245               | 222,692        | 143               | 160,364          | -                 | -              |
| Others                          | 193               | 149,373        | 88                | 202,657          | -                 | -              |
| <b>Total</b>                    | <b>3,438</b>      | <b>669,065</b> | <b>3,921</b>      | <b>1,186,885</b> | <b>5,526</b>      | <b>584,696</b> |

Source: Department of Statistics

## Malaysia's imports of gypsum, by country

| Country                         | 2012              |                    | 2013              |                    | 2014 <sup>P</sup> |                    |
|---------------------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|
|                                 | Quantity (tonnes) | Value (RM)         | Quantity (tonnes) | Value (RM)         | Quantity (tonnes) | Value (RM)         |
| <i>Gypsum (HS: 2520.10.000)</i> |                   |                    |                   |                    |                   |                    |
| Thailand                        | 496,314           | 98,613,315         | 332,585           | 97,580,811         | 302,936           | 97,790,937         |
| Indonesia                       | 720               | 424,296            | 5,503             | 2,836,688          | 12,601            | 5,029,482          |
| China                           | 1,228             | 1,060,147          | 1,174             | 1,083,532          | 1,959             | 1,765,510          |
| Germany                         | 689               | 857,538            | 952               | 969,193            | 611               | 631,001            |
| Iran                            | 2,938             | 702,864            | 1,877             | 612,543            | 1,285             | 387,722            |
| Others                          | 5,311             | 3,576,524          | 991               | 574,131            | 95                | 151,846            |
| <b>Total</b>                    | <b>507,199</b>    | <b>105,234,684</b> | <b>343,081</b>    | <b>103,656,898</b> | <b>319,487</b>    | <b>105,756,498</b> |

Source: Department of Statistics

## Price (per tonne)

| Grade             | 2011 | 2012 | 2013 | 2014 |
|-------------------|------|------|------|------|
| Crude, ex-mine UK | N.A  | N.A  | N.A  | N.A  |

Source: Industrial Minerals April 2004

## World production of gypsum

| Country                      | tonnes '000    |                |                   | % of 2014 <sup>p</sup> |
|------------------------------|----------------|----------------|-------------------|------------------------|
|                              | 2012           | 2013           | 2014 <sup>p</sup> |                        |
| China                        | 48,000         | 129,000        | 132,000           | 53.64                  |
| USA                          | 15,800         | 16,300         | 17,100            | 6.95                   |
| Iran                         | 13,000         | 15,000         | 13,000            | 5.28                   |
| Thailand                     | 19,000         | 6,300          | 6,300             | 2.56                   |
| Spain                        | 7,100          | 6,400          | 6,400             | 2.60                   |
| Russia                       | 3,150          | 5,100          | 5,300             | 2.15                   |
| Japan                        | 5,500          | 5,500          | 5,500             | 2.23                   |
| Mexico                       | 4,690          | 5,090          | 5,000             | 2.03                   |
| Italy                        | 4,130          | 4,100          | 4,100             | 1.67                   |
| India                        | 2,750          | 3,540          | 3,500             | 1.42                   |
| Brazil                       | 3,230          | 3,750          | 3,700             | 1.50                   |
| Australia                    | 2,500          | 3,500          | 3,500             | 1.42                   |
| Saudi Arabia                 | 2,500          | 2,400          | 2,400             | 0.98                   |
| France                       | 2,300          | 2,300          | 2,300             | 0.93                   |
| Turkey                       | 2,100          | 8,300          | 8,300             | 3.37                   |
| Canada                       | 2,550          | 2,650          | 1,800             | 0.73                   |
| Other countries              | 23,350         | 25,350         | 25,900            | 10.52                  |
| <b>World total (rounded)</b> | <b>152,000</b> | <b>244,580</b> | <b>246,100</b>    |                        |

Source: United States Geological Survey

## Review

Gypsum and anhydrite are two naturally occurring forms of calcium sulphate compounds. Gypsum is in the hydrated form ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ) and anhydrite, as its name implies, is in an anhydrous form ( $\text{CaSO}_4$ ). Besides its natural form, synthetic chemical or by-product gypsum is increasingly available. The main uses of gypsum are as plaster of Paris, as additives in cement and glass manufacturing, soil conditioners, fillers, extenders, concrete and blocks.

Ground gypsum is used extensively in agriculture as fertilizers to improve calcium and sulphur deficiencies in soil, and as a conditioner to reduce soil salinity. Anhydrite is used in the manufacture of sulphuric acid and cement clinker. In Malaysia, gypsum is used for the manufacture of Portland cement, wallboard, plaster products and ceramics. A large quantity of by-product gypsum (known as titanogypsum) in Malaysia is produced by Tioxide Malaysia, a titanium dioxide plant in Terengganu. It is also a by-product

through the production of activated clay. However, it has not been used commercially. In some countries, titanogypsum has been used as a substitute for mined gypsum, principally for wallboard manufacture, agricultural purposes, highway construction and cement production.

The country's requirement of gypsum is fully met through imports. In 2014, imports of gypsum and anhydrite amounted to 319,487 tonnes worth RM105.8 million which was a decrease of 6.9% from 343,081 tonnes worth RM103.7 million in the previous year. The source of the imported gypsum was mostly from Thailand, Indonesia, China, Germany and Iran. However, some of the imported gypsum was processed for export. During the year, Malaysia exported a total of 5,526 tonnes of gypsum worth RM0.85 million compared to 3,921 tonnes worth RM1.19 million in 2013. The gypsum was exported mainly to Indonesia, China, Australia and New Zealand. ■

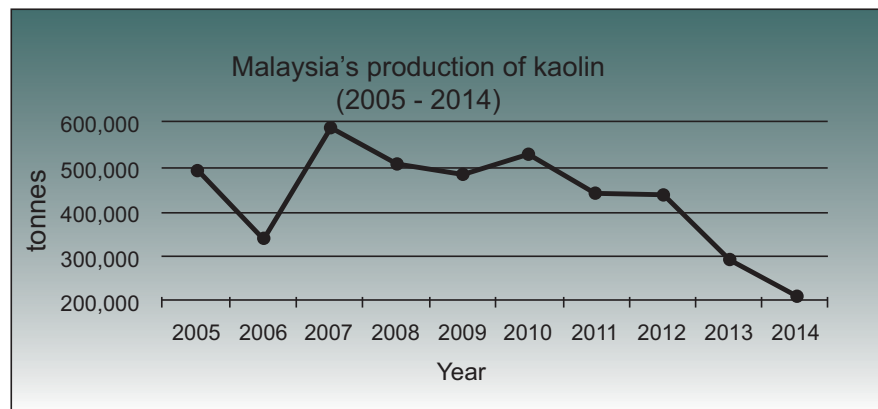
## KAOLIN

### Malaysia's production of kaolin

| State        | 2011           |           | 2012           |           | 2013           |           | 2014           |           |
|--------------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|
|              | tonnes         | mines     | tonnes         | mines     | tonnes         | mines     | tonnes         | mines     |
| Perak        | 297,237        | 18        | 301,038        | 18        | 205,979        | 14        | 102,579        | 15        |
| Johor        | 38,413         | 8         | 21,385         | 5         | 28,651         | 6         | 30,073         | 1         |
| Pahang       | 106,900        | 1         | 116,500        | 1         | 58,850         | 1         | 87,000         | 2         |
| <b>Total</b> | <b>442,550</b> | <b>27</b> | <b>438,923</b> | <b>24</b> | <b>293,480</b> | <b>21</b> | <b>219,652</b> | <b>18</b> |

### Malaysia's historic production (kaolin)

| Year | tonnes  |
|------|---------|
| 2005 | 494,511 |
| 2006 | 341,223 |
| 2007 | 587,508 |
| 2008 | 506,462 |
| 2009 | 487,632 |
| 2010 | 530,331 |
| 2011 | 442,550 |
| 2012 | 438,923 |
| 2013 | 293,480 |
| 2014 | 219,652 |



84

## External Trade

### Exports

| H.S.        | Commodity               | tonnes |        |                   | RM '000 |        |                   |
|-------------|-------------------------|--------|--------|-------------------|---------|--------|-------------------|
|             |                         | 2012   | 2013   | 2014 <sup>P</sup> | 2012    | 2013   | 2014 <sup>P</sup> |
| 2507.00.000 | Kaolin & kaolinic clays | 56,322 | 49,840 | 48,297            | 26,620  | 26,461 | 27,101            |

### Imports

| H.S.        | Commodity               | tonnes |        |                   | RM '000 |        |                   |
|-------------|-------------------------|--------|--------|-------------------|---------|--------|-------------------|
|             |                         | 2012   | 2013   | 2014 <sup>P</sup> | 2012    | 2013   | 2014 <sup>P</sup> |
| 2507.00.000 | Kaolin & kaolinic clays | 64,461 | 90,635 | 92,773            | 58,355  | 66,238 | 68,616            |

Source: Department of Statistics

## Malaysia's exports of kaolin, by country

| Country                         | 2012              |                   | 2013              |                   | 2014 <sup>p</sup> |                   |
|---------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|                                 | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        |
| <i>Kaolin (HS: 2507.00.000)</i> |                   |                   |                   |                   |                   |                   |
| Thailand                        | 13,536            | 7,308,799         | 13,549            | 7,043,145         | 11,224            | 6,691,563         |
| Taiwan                          | 5,758             | 2,604,871         | 8,376             | 2,786,132         | 10,222            | 3,614,328         |
| ROK                             | 5,198             | 1,919,190         | 5,264             | 1,991,663         | 6,662             | 2,647,177         |
| Indonesia                       | 6,351             | 2,097,780         | 8,107             | 2,601,093         | 3,852             | 1,780,513         |
| Bangladesh                      | 10,850            | 2,871,532         | 3,837             | 3,002,063         | 3,582             | 2,604,781         |
| Others                          | 14,629            | 9,817,339         | 10,706            | 9,037,175         | 12,754            | 9,762,888         |
| <b>Total</b>                    | <b>56,322</b>     | <b>26,619,511</b> | <b>49,840</b>     | <b>26,461,271</b> | <b>48,297</b>     | <b>27,101,250</b> |

Source: Department of Statistics

## Malaysia's imports of kaolin, by country

| Country                         | 2012              |                   | 2013              |                   | 2014 <sup>p</sup> |                   |
|---------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|                                 | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        |
| <i>Kaolin (HS: 2507.00.000)</i> |                   |                   |                   |                   |                   |                   |
| China                           | 26,812            | 27,404,629        | 49,232            | 30,038,389        | 48,763            | 31,866,549        |
| USA                             | 16,212            | 12,603,348        | 24,116            | 18,721,991        | 24,607            | 18,758,931        |
| UK                              | 3,823             | 3,801,696         | 4,513             | 5,310,472         | 4,967             | 6,200,074         |
| Thailand                        | 8,488             | 4,942,524         | 6,992             | 4,861,784         | 9,432             | 5,627,992         |
| India                           | 1,156             | 1,428,921         | 1,419             | 1,731,664         | 1,060             | 1,286,600         |
| Others                          | 7,970             | 8,173,785         | 4,363             | 5,573,909         | 3,944             | 4,876,222         |
| <b>Total</b>                    | <b>64,461</b>     | <b>58,354,903</b> | <b>90,635</b>     | <b>66,238,209</b> | <b>92,773</b>     | <b>68,616,368</b> |

Source: Department of Statistics

## Price (per tonne unless indicated)

| Kaolin                         | 2011         | 2012         | 2013         | 2014        |
|--------------------------------|--------------|--------------|--------------|-------------|
| <b>Ex-Georgia plant, s/ton</b> |              |              |              |             |
| Filler, bulk                   | N.A          | N.A          | N.A          | N.A         |
| Paper coating grade            | USD100 - 195 | USD161 - 209 | USD167 - 217 | USD112-8180 |
| Sanitaryware grade, bagged     | N.A          | N.A          | N.A          | N.A         |
| Tableware grade, bagged        | N.A          | N.A          | N.A          | N.A         |
| Calcined, bulk                 | N.A          | N.A          | N.A          | N.A         |
| <b>Ceramic grade, bulk</b>     |              |              |              |             |
| Refined, ex-works France       | N.A          | N.A          | N.A          | N.A         |
| Refined, FOB Rotterdam         | N.A          | N.A          | N.A          | N.A         |

Source: Industrial Minerals April 2013

## World mine production of kaolin

| Country                      | tonnes '000   |               |                   | % of 2014 <sup>p</sup> |
|------------------------------|---------------|---------------|-------------------|------------------------|
|                              | 2012          | 2013          | 2014 <sup>p</sup> |                        |
| Uzbekistan <sup>3</sup>      | 4,900         | 7,500         | 7,000             | 17.39                  |
| USA <sup>1</sup>             | 5,980         | 5,950         | 5,830             | 14.48                  |
| Germany <sup>1</sup>         | 4,900         | 4,900         | 4,500             | 11.18                  |
| Czech Republic <sup>3</sup>  | 3,320         | 3,110         | 3,110             | 7.73                   |
| Brazil <sup>2</sup>          | 1,950         | 2,200         | 1,800             | 4.47                   |
| Turkey                       | 1,200         | 3,800         | 3,800             | 9.44                   |
| Ukraine <sup>3</sup>         | 1,300         | 1,100         | 1,100             | 2.73                   |
| UK <sup>1</sup>              | 900           | 900           | 900               | 2.24                   |
| Italy                        | 640           | 640           | 640               | 1.59                   |
| <b>Malaysia*</b>             | <b>439</b>    | <b>293</b>    | <b>208</b>        | <b>0.52</b>            |
| Spain                        | 303           | 303           | 205               | 0.51                   |
| Mexico                       | 163           | 163           | 160               | 0.40                   |
| Other countries              | 8,540         | 9,730         | 11,000            | 27.33                  |
| <b>World total (rounded)</b> | <b>36,600</b> | <b>40,589</b> | <b>40,253</b>     |                        |

<sup>1</sup> sales<sup>2</sup> beneficiated<sup>3</sup> crudeSource: United States Geological Survey Minerals  
\*Mineral and Geoscience Department Malaysia



## Review

Kaolin (china clay) is a white inert clay with a broad pH and low conductivity. It has excellent coating properties and is suitable for applications in the ceramics, paper, rubber, plastics and aluminium industry.

In Malaysia, kaolin is usually found in partly decomposed granite. Processed or refined kaolin is available in the form of white powder or granules and has natural whiteness and fineness properties. About 118 Mt of kaolin resources have been identified throughout the country. The major deposits are located mainly in Perak (59 Mt), Johor (25 Mt), Sarawak (23 Mt), Terengganu (5.3 Mt), Pahang (4.5 Mt), Sabah (0.6 Mt), Pulau Pinang (0.4 Mt) and Kelantan (0.2 Mt).

In 2014, a total of 18 kaolin producers were recorded. During the year, Malaysia's kaolin production dropped by 25.2% to 219,652 tonnes valued at RM15.8 million from 293,480 tonnes valued at RM28.8 million in 2013. Perak continued to record the most number of producers (15), followed by Pahang (2) and Johor (1).

The country's largest kaolin production came from Perak (49.96%). They produced various grades of processed kaolin for local as well as for export. The main uses of kaolin in Malaysia are for paper filler and for the manufacture of ceramics, cement, paint, rubber and chemical products. In 2014, the total kaolin production from Perak decreased to 102,579 tonnes compared with 205,979 tonnes in previous year.

During 2014, Malaysia exported a total of 48,297 tonnes of kaolin worth RM27.1 million compared with 49,840 tonnes worth RM26.46 million in the previous year. The kaolin was exported mainly to Thailand, Taiwan, ROK, Bangladesh and Indonesia. At the same time, Malaysia also imported a total of 92,773 tonnes of kaolin worth RM68.62 million compared to 90,635 tonnes worth RM66.24 million in 2013. The major sources of imported kaolin were China, USA, UK, Thailand and India. ■

## LIMESTONE

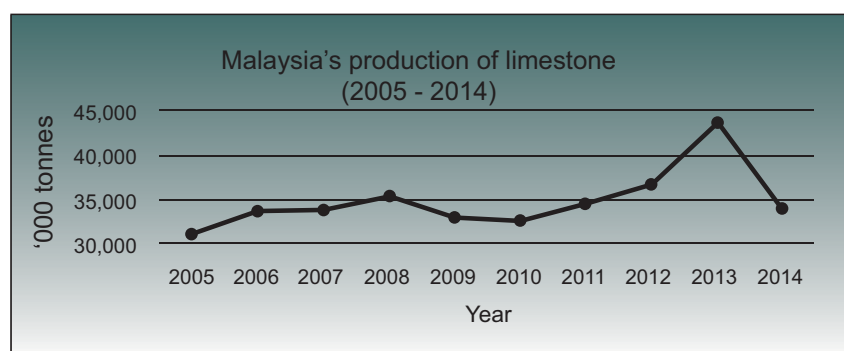
### Malaysia's production of limestone (exclude dimension stone)

| State        | 2012              |           | 2013              |            | 2014 <sup>P</sup> |           |
|--------------|-------------------|-----------|-------------------|------------|-------------------|-----------|
|              | tonnes            | quarries  | tonnes            | quarries   | tonnes            | quarries  |
| Perak        | 15,155,762        | 37        | 25,978,894        | 52         | 19,313,814        | 51        |
| Sarawak      | 7,056,823         | 19        | 6,133,140         | 18         | 5,113,135         | 18        |
| Selangor     | 2,106,581         | 4         | 2,106,581         | 1          | 1,431,599         | 1         |
| Pahang       | 1,773,737         | 7         | 1,636,088         | 6          | 1,653,202         | 7         |
| Perlis       | 2,047,038         | 6         | 172,193           | 10         | 2,047,483         | 3         |
| Sabah        | 325,207           | 2         | 864,977           | 5          | 523,977           | 2         |
| Kedah        | 4,488,195         | 3         | 284,332           | 6          | 3,682,071         | 3         |
| Kelantan     | 257,732           | 3         | 226,101           | 3          | 133,636           | 3         |
| N.Sembilan   | 1,905,459         | 1         | 2,475,636         | 1          | 5,033,941         | 1         |
| <b>Total</b> | <b>36,579,718</b> | <b>80</b> | <b>43,728,648</b> | <b>102</b> | <b>38,932,858</b> | <b>89</b> |

88

### Malaysia's historic production of limestone

| Year | '000 tonnes |
|------|-------------|
| 2005 | 30,868      |
| 2006 | 33,472      |
| 2007 | 33,689      |
| 2008 | 35,227      |
| 2009 | 32,808      |
| 2010 | 32,399      |
| 2011 | 34,300      |
| 2012 | 36,580      |
| 2013 | 43,729      |
| 2014 | 38,933      |



## External Trade

## Exports

| H.S. | Commodity      | tonnes    |           |                   | RM '000 |         |                   |
|------|----------------|-----------|-----------|-------------------|---------|---------|-------------------|
|      |                | 2012      | 2013      | 2014 <sup>P</sup> | 2012    | 2013    | 2014 <sup>P</sup> |
| 2518 | Dolomite       | 6         | 176       | 2                 | 51      | 112     | 21                |
| 2521 | Limestone flux | 1,097,340 | 817,498   | 1,071,465         | 92,431  | 111,725 | 145,678           |
| 2522 | Lime           | 366,785   | 373,921   | 400,224           | 132,592 | 140,052 | 151,589           |
| 2523 | Cement         | 2,825,207 | 2,690,259 | 2,253,434         | 505,587 | 504,330 | 452,878           |

## Imports

| H.S. | Commodity      | tonnes    |           |                   | RM '000 |         |                   |
|------|----------------|-----------|-----------|-------------------|---------|---------|-------------------|
|      |                | 2012      | 2013      | 2014 <sup>P</sup> | 2012    | 2013    | 2014 <sup>P</sup> |
| 2518 | Dolomite       | 7,663     | 7,858     | 4,993             | 4,738   | 5,165   | 5,769             |
| 2521 | Limestone flux | 545       | 445       | 601               | 293     | 802     | 812               |
| 2522 | Lime           | 9,483     | 22,354    | 14,764            | 6,311   | 10,562  | 7,673             |
| 2523 | Cement         | 3,637,995 | 3,708,575 | 3,912,772         | 703,525 | 706,569 | 727,799           |

Source: Department of Statistics

## Malaysia's exports of limestone, by country

| Country                                     | 2012              |                   | 2013              |                    | 2014 <sup>P</sup> |                    |
|---|-------------------|-------------------|-------------------|--------------------|-------------------|--------------------|
|   | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)         | Quantity (tonnes) | Value (RM)         |
| <i>Limestone Flux<br/>(HS: 2521.00.000)</i> |                   |                   |                   |                    |                   |                    |
| India                                       | 365,270           | 35,073,636        | 314,836           | 48,784,384         | 428,756           | 67,763,113         |
| Japan                                       | 258,150           | 21,471,784        | 206,525           | 24,583,214         | 265,250           | 30,801,011         |
| Singapore                                   | 135,929           | 14,656,920        | 124,275           | 19,161,612         | 128,483           | 21,017,800         |
| Indonesia                                   | 282,081           | 14,625,455        | 119,752           | 11,756,446         | 191,398           | 13,916,151         |
| Bangladesh                                  | 1,638             | 454,635           | 4,161             | 1,152,924          | 19,727            | 6,384,726          |
| Others                                      | 54,272            | 6,148,957         | 47,949            | 6,286,633          | 37,851            | 5,795,614          |
| <b>Total</b>                                | <b>1,097,340</b>  | <b>92,431,387</b> | <b>817,498</b>    | <b>111,725,213</b> | <b>1,071,465</b>  | <b>145,678,415</b> |

## Malaysia's imports of limestone, by country

| Country                                 | 2012              |                | 2013              |                | 2014 <sup>P</sup> |                |
|---|-------------------|----------------|-------------------|----------------|-------------------|----------------|
|   | Quantity (tonnes) | Value (RM)     | Quantity (tonnes) | Value (RM)     | Quantity (tonnes) | Value (RM)     |
| <i>Limestone Flux (HS: 2521.00.000)</i> |                   |                |                   |                |                   |                |
| ROK                                     | 405               | 116,519        | 12                | 343,826        | 12                | 340,856        |
| Singapore                               | -                 | -              | 7                 | 26,282         | 46                | 110,550        |
| China                                   | 13                | 14,651         | 247               | 242,841        | 302               | 104,090        |
| Australia                               | 79                | 81,985         | 102               | 99,103         | 104               | 98,630         |
| Germany                                 | 24                | 27,519         | 19                | 33,462         | 34                | 46,465         |
| Others                                  | 24                | 52,258         | 58                | 56,016         | 102               | 111,040        |
| <b>Total</b>                            | <b>545</b>        | <b>292,932</b> | <b>445</b>        | <b>801,530</b> | <b>601</b>        | <b>811,631</b> |

## Review

Limestone is the most widely used of all industrial minerals and has the broadest range of applications related to its physical properties, chemical properties or both. Physical properties are important if the stone is used as it is, such as for aggregate and dimension stone. Chemical and brightness properties are important if the rock undergoes changes from one form of matter to another, such as in the manufacture of cement or fillers.

In Malaysia, limestone is quarried for use in the manufacture of aggregates (concrete, road, filter stone and terrazzo), dimension stone, agricultural and industrial applications, quicklime, hydrated lime, ground calcium carbonate, precipitated calcium carbonate, clinker, chemical and pharmaceutical. However, only limestone that is used for rock aggregates, cement manufacture and agricultural applications are covered in this chapter.

In 2014, about 38.93 Mt of limestone was produced, decreased by 10.9% compared to 43.73 Mt of limestone produced in the previous year. From 86 quarries in 2014, there were 12 quarries producing limestone solely for cement making industries and 77 for aggregates. The limestone produced is largely consumed for cement making industries (65.2%) and rock aggregates (34.8%). Most of the limestone produced came from the state of Perak and it continued to be the major limestone producer in the country with a production of 19.3 Mt, which accounts

for 49.6% of the total country's production. Perak also has the highest number of producers with 51 quarries from the total of 89 quarries in the country. The other states that recorded high limestone production in 2014 were Sarawak, Negeri Sembilan, Kedah, Perlis, Pahang and Selangor.

In 2014, there were 15 various types of cement plants including a white cement plant and one clinker plant operating in the country. Nine of these cement plants are integrated and the other six are cement grinding plants. Four of the integrated plants are located in Perak and one each in Kedah, Negeri Sembilan, Pahang, Perlis and Selangor. The sole clinker plant located in Sarawak produces and supplies only clinker. Currently, the players in cement production are Lafarge Cement Bhd., YTL Cement, CIMA Group, Tasek Corporation Bhd., CMS Group, Cement Industries (Sabah) Sdn. Bhd., Holcim (M) Sdn. Bhd., Aalborg White Asia Sdn. Bhd and Hume Cement Sdn. Bhd.

The Minerals and Geoscience Department of Malaysia has identified estimated resources of about 30,480 Mt of limestone that are suitable for various uses such as cement manufacturing, dimension stone and other limestone-based products. These resources are mostly located in Sabah (4,754 Mt), Perak (2,599 Mt), Pahang (1,720 Mt), Kelantan (1,308 Mt) and Kedah (1,220 Mt). Some of these resources are presently being quarried. ■

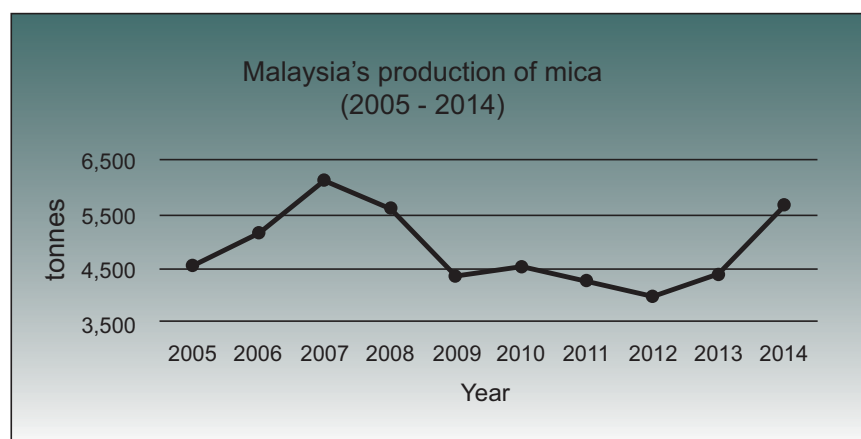
## MICA

### Malaysia's production of mica

| State        | 2011         |          | 2012         |          | 2013         |          | 2014         |          |
|--------------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|
|              | tonnes       | mines    | tonnes       | mines    | tonnes       | mines    | tonnes       | mines    |
| Perak        | 4,245        | 3        | 3,967        | 2        | 4,363        | 2        | 5,659        | 2        |
| <b>Total</b> | <b>4,245</b> | <b>3</b> | <b>3,967</b> | <b>2</b> | <b>4,363</b> | <b>2</b> | <b>5,659</b> | <b>2</b> |

### Malaysia's historic production of mica

| Year | tonnes |
|------|--------|
| 2005 | 4,544  |
| 2006 | 5,152  |
| 2007 | 6,118  |
| 2008 | 5,593  |
| 2009 | 4,324  |
| 2010 | 4,515  |
| 2011 | 4,245  |
| 2012 | 3,967  |
| 2013 | 4,363  |
| 2014 | 5,659  |



## External Trade

### Exports

| H.S.        | Commodity  | tonnes |       |                   | RM '000 |       |                   |
|-------------|--|--------|-------|-------------------|---------|-------|-------------------|
|             |  | 2012   | 2013  | 2014 <sup>P</sup> | 2012    | 2013  | 2014 <sup>P</sup> |
| 2525.10.000 | Crude mica and mica rifted into sheet or splitting | 50     | 14    | –                 | 6       | 26    | –                 |
| 2525.20.000 | Mica powder  | 6,281  | 6,897 | 6,133             | 9,298   | 9,192 | 9,106             |
| 2525.30.000 | Mica waste   | –      | –     | 2                 | –       | –     | 7                 |

## Imports

| H.S.        | Commodity  | tonnes |      |                   | RM '000 |       |                   |
|-------------|--|--------|------|-------------------|---------|-------|-------------------|
|             |  | 2012   | 2013 | 2014 <sup>P</sup> | 2012    | 2013  | 2014 <sup>P</sup> |
| 2525.10.000 | Crude mica and mica rifted into sheet or splitting | 111    | 138  | 162               | 211     | 177   | 274               |
| 2525.20.000 | Mica powder  | 713    | 830  | 1,023             | 5,603   | 4,849 | 5,137             |
| 2525.30.000 | Mica waste   | –      | 17   | 58                | –       | 78    | 172               |

## Malaysia's exports of mica, by country

| Country                       | 2012              |                  | 2013              |                  | 2014 <sup>P</sup> |                  |
|-------------------------------|-------------------|------------------|-------------------|------------------|-------------------|------------------|
|                               | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)       |
| <i>Mica (HS: 2525.20.000)</i> |                   |                  |                   |                  |                   |                  |
| Japan                         | 1,860             | 3,886,040        | 1,387             | 3,041,883        | 1,312             | 2,267,799        |
| Thailand                      | 1,333             | 1,171,190        | 1,259             | 1,083,750        | 1,322             | 1,620,576        |
| Indonesia                     | 917               | 928,063          | 899               | 914,653          | 967               | 1,036,069        |
| ROK                           | 964               | 822,105          | 914               | 818,267          | 947               | 1,018,003        |
| USA                           | 115               | 843,647          | 559               | 770,773          | 132               | 1,017,917        |
| Others                        | 1,093             | 1,646,964        | 1,878             | 2,562,441        | 1,453             | 2,145,975        |
| <b>Total</b>                  | <b>6,281</b>      | <b>9,298,009</b> | <b>6,897</b>      | <b>9,191,767</b> | <b>6,133</b>      | <b>9,106,339</b> |

Source: Department of Statistics

## Malaysia's imports of mica, by country

| Country                       | 2012              |                  | 2013              |                  | 2014 <sup>P</sup> |                  |
|-------------------------------|-------------------|------------------|-------------------|------------------|-------------------|------------------|
|                               | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)       |
| <i>Mica (HS: 2525.20.000)</i> |                   |                  |                   |                  |                   |                  |
| Japan                         | 292               | 4,479,414        | 306               | 3,647,465        | 202               | 3,262,047        |
| Switzerland                   | 48                | 132,617          | 51                | 226,735          | 148               | 415,124          |
| India                         | 104               | 190,793          | 245               | 256,879          | 299               | 280,016          |
| China                         | 21                | 18,000           | 42                | 80,834           | 131               | 272,734          |
| ROK                           | 71                | 199,046          | 63                | 179,994          | 87                | 253,758          |
| Others                        | 177               | 583,382          | 123               | 457,542          | 156               | 652,834          |
| <b>Total</b>                  | <b>713</b>        | <b>5,603,252</b> | <b>830</b>        | <b>4,849,449</b> | <b>1,023</b>      | <b>5,136,513</b> |

Source: Department of Statistics

**Price (per tonne unless indicated)**

| Mica  | 2011           | 2012           | 2013           | 2014           |
|---|----------------|----------------|----------------|----------------|
| Indian Wet ground, CIF Europe<br><b>FOB Madras, India</b> | USD600 - 900   | USD600 - 900   | USD600 - 900   | USD600 - 900   |
| Dry ground<br><b>FOB plant, USA</b>                       | USD300 - 400   | USD300 - 400   | USD300 - 400   | USD300 - 400   |
| Dry ground  | N.A            | N.A            | N.A            | N.A            |
| Wet ground  | USD700 - 1,300 | USD700 - 1,300 | USD700 - 1,300 | USD700 - 1,300 |
| Micronised  | USD700 - 1,000 | USD700 - 1,000 | USD700 - 1,000 | USD700 - 1,000 |
| Flake   | USD350 - 500   | USD350 - 500   | USD350 - 500   | USD350 - 500   |

Source: Industrial Minerals, April 2014

**Review**

Mica is a group of silicate minerals composed of varying amounts of aluminium, potassium, magnesium, iron and water. Two mica minerals which are commercially important are muscovite (potassium mica) and phlogopite (magnesium mica). However, the term 'mica' is used to signify sericite or muscovite only. The quality of mica is determined by its chemical composition and particle size. As raw mica varies in chemical composition, processing is important in order to control the composition to a consistent value. Mica is used in electronics, insulators, paints, joint cements, dusting agents, well drilling muds, lubricants, plastics, roofing, rubber and welding rods.

In this report, mica is referred as fine-grained sericite in the form of weathered sericite schist. The mica mined is naturally fine-grained and has unique properties of excellent smoothness with very fine particle size. However, in Malaysia the mica produced in Perak is in its crude form and consists mainly of flake muscovite. The fine muscovite flakes are recovered from schistose rocks through a screening process. There are two common screening (wet and dry) processes

that are used to produce mica flakes according to the required grain size. Scrap and flake muscovite are processed to various sizes of ground mica powder. It is commonly utilized as filler that valued for its physical smooth properties for industrial applications such as paints and cosmetics.

In 2014, there were two mica producers operating on ex-tin mining land in Bidor, Perak namely Tasik Mahir Sdn. Bhd. and Techcera (M) Sdn. Bhd. For the last five years, Malaysia produced about 4,000 tonnes of mica annually. The total annual production of mica in 2014 increased by 29.7% to 5,659 tonnes compared with 4,363 tonnes recorded in 2013.

The mica powder is exported mainly to Japan, Thailand, Indonesia, ROK and USA. A total of 6,133 tonnes of mica powder valued at RM9.11 million was exported in 2014 compared with 6,897 tonnes valued at RM9.19 million in the previous year. At the same time, Malaysia imported a total of 1,023 tonnes of mica valued at RM5.14 million compared with 830 tonnes valued at RM4.85 million in the previous year. ■

## PHOSPHATE ROCK

### External Trade

#### Exports

| H.S.    | Commodity                           | tonnes |      |                   | RM '000 |      |                   |
|---------|-------------------------------------|--------|------|-------------------|---------|------|-------------------|
|         |                                     | 2012   | 2013 | 2014 <sup>P</sup> | 2012    | 2013 | 2014 <sup>P</sup> |
| 3101.00 | Guano                               | 594    | 470  | 98                | 2,300   | 529  | 3,077             |
| 2510.10 | Natural calcium phosphates unground | 75     | 0.3  | 32                | 60      | 9    | 21                |
| 2510.20 | Natural calcium phosphates ground   | 20     | 35   | 350               | 26      | 28   | 140               |

#### Imports

| H.S.    | Commodity                           | tonnes  |         |                   | RM '000 |         |                   |
|---------|-------------------------------------|---------|---------|-------------------|---------|---------|-------------------|
|         |                                     | 2012    | 2013    | 2014 <sup>P</sup> | 2012    | 2013    | 2014 <sup>P</sup> |
| 3101.00 | Guano                               | 798     | 3       | 3                 | 431     | 33      | 2                 |
| 2510.10 | Natural calcium phosphates unground | 526     | 1,548   | 2,697             | 269     | 790     | 1,157             |
| 2510.20 | Natural calcium phosphates ground   | 376,464 | 377,068 | 401,703           | 191,240 | 174,736 | 152,819           |

Source: Department of Statistics

#### Price (per tonne)

| Phosphates  | 2011 | 2012 | 2013 | 2014       |
|---|------|------|------|------------|
| <b>Moroccan,</b><br>75-77%, BPL, FAS, Casablanca    | N.A  | N.A  | N.A  | N.A        |
| 70-72%, BPL, FAS, Casablanca                        | N.A  | N.A  | N.A  | USD100-110 |
| <b>Central Florida</b><br><b>Phosphates DAP FOB</b> | N.A  | N.A  | N.A  | USD477-549 |

Source: Industrial Minerals, April 2014



## World production of phosphate rock

| Country                      | tonnes             |                    |                    | % of 2014 <sup>P</sup> |
|------------------------------|--------------------|--------------------|--------------------|------------------------|
|                              | 2012               | 2013               | 2014 <sup>P</sup>  |                        |
| China*                       | 95,300,000         | 108,000,000        | 100,000,000        | 45.48                  |
| USA                          | 30,100,000         | 31,200,000         | 27,100,000         | 12.32                  |
| Morocco and Western Sahara   | 28,000,000         | 26,400,000         | 30,000,000         | 13.64                  |
| Russia                       | 11,200,000         | 10,000,000         | 10,000,000         | 4.55                   |
| Jordan                       | 6,380,000          | 5,400,000          | 6,000,000          | 2.73                   |
| Brazil                       | 6,750,000          | 6,000,000          | 6,750,000          | 3.07                   |
| Egypt                        | 6,240,000          | 6,500,000          | 6,000,000          | 2.73                   |
| Tunisia                      | 2,600,000          | 3,500,000          | 5,000,000          | 2.27                   |
| Peru                         | 3,210,000          | 2,580,000          | 2,600,000          | 1.18                   |
| Israel                       | 3,510,000          | 3,500,000          | 3,600,000          | 1.64                   |
| Australia                    | 2,600,000          | 2,600,000          | 2,600,000          | 1.18                   |
| South Africa                 | 2,240,000          | 2,300,000          | 2,200,000          | 1.00                   |
| Syria                        | 1,000,000          | 500,000            | 1,000,000          | 0.45                   |
| Other countries              | 17,660,000         | 16,640,000         | 17,050,000         | 7.75                   |
| <b>World total (rounded)</b> | <b>217,000,000</b> | <b>225,120,000</b> | <b>219,900,000</b> |                        |

Source: United States Geological Survey  
\* Production data for large mines only

## Review

Phosphate rock is a major source for phosphorus and a general term used to describe mineral assemblages that naturally contain one or more phosphatic minerals of high purity and quantity to permit its commercial use as a source of phosphatic compounds or phosphorous elements. Another source of phosphate is from guano in the form of accumulated deposits of bat droppings that are found in caves. It is worked for phosphate or nitrate, while decomposed guano is made up of calcium phosphate. Phosphate rocks and guano are mainly used for fertilizer production, which is of vital importance to the agricultural sector.

The domestic requirement for phosphates is fully depended on imports. In 2014, Malaysia imported a

total of 404,403 tonnes of phosphate rock and guano valued at RM153.98 million compared with 378,619 tonnes valued at RM175.56 million in the previous year. Meanwhile, the total exports of phosphate and guano were 480 tonnes valued at RM3.24 million in 2014 compared with 505 tonnes valued at RM0.57 in 2013.

China is the major producer of phosphates which contributed 45.5% (100 Mt) of the total world production. The other two major producers are USA and Morocco and Western Sahara that accounts for about 26% of the global phosphate rock production in 2014. ■

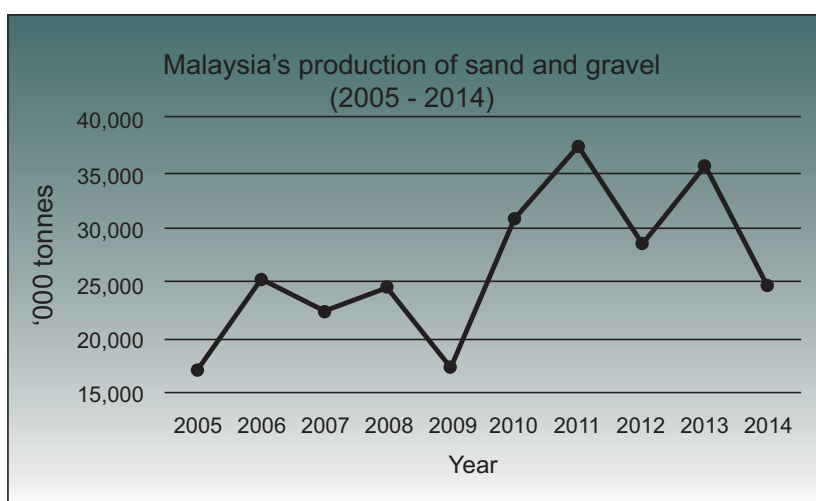
## SAND AND GRAVEL

### Malaysia's production of sand and gravel

| State           | 2011          |              | 2012          |            | 2013          |            | 2014          |            |
|-----------------|---------------|--------------|---------------|------------|---------------|------------|---------------|------------|
|                 | '000 tonnes   | producer     | '000 tonnes   | producer   | '000 tonnes   | producer   | '000 tonnes   | producer   |
| Selangor / KL   | 8,645         | 41           | 4,881         | 47         | 8,645         | 41         | 4,996         | 56         |
| Johor           | 4,311         | 110          | 1,096         | 91         | 8,399         | 102        | 6,043         | 75         |
| Perak           | 8,505         | 217          | 8,732         | 204        | 5,708         | 162        | 7,615         | 193        |
| Pahang          | 6,946         | 142          | 5,626         | 139        | 4,793         | 130        | 2,333         | 132        |
| Sarawak         | 1,507         | 24           | 1,998         | 24         | 3,020         | 28         | 3,000*        | 27         |
| Negeri Sembilan | 2,132         | 79           | 1,644         | 64         | 1,644         | 70         | 1,870         | 70         |
| Kedah           | 2,802         | 174          | 2,283         | 162        | 1,464         | 153        | 1,967         | 153        |
| Terengganu      | 982           | 85           | 1,221         | 92         | 812           | 90         | 722           | 90         |
| Melaka          | 423           | 14           | 287           | 11         | 279           | 10         | 246           | 10         |
| Kelantan        | 193           | 98           | 212           | 77         | 174           | 86         | 463           | 79         |
| Sabah           | 894           | 52           | 612           | 59         | 638           | 58         | 600*          | 58         |
| Pulau Pinang    | -             | -            | -             | -          | -             | -          | 7             | 1          |
| <b>Total</b>    | <b>37,340</b> | <b>1,036</b> | <b>28,592</b> | <b>970</b> | <b>35,576</b> | <b>930</b> | <b>29,862</b> | <b>944</b> |

### Malaysia's historic production of sand and gravel

| Year | '000 tonnes |
|------|-------------|
| 2005 | 17,071      |
| 2006 | 25,226      |
| 2007 | 22,370      |
| 2008 | 24,471      |
| 2009 | 17,382      |
| 2010 | 30,698      |
| 2011 | 37,339      |
| 2012 | 28,592      |
| 2013 | 35,578      |
| 2014 | 29,862      |



## External Trade

### Exports

| H.S.    | Commodity          | tonnes |        |                   | RM '000 |       |                   |
|---------|--------------------|--------|--------|-------------------|---------|-------|-------------------|
|         |                    | 2012   | 2013   | 2014 <sup>P</sup> | 2012    | 2013  | 2014 <sup>P</sup> |
| 2505.90 | Other natural sand | 2,368  | 13,100 | 5,074             | 936     | 1,612 | 3,989             |

Source: Department of Statistics

### Imports

| H.S.    | Commodity          | tonnes |       |                   | RM '000 |       |                   |
|---------|--------------------|--------|-------|-------------------|---------|-------|-------------------|
|         |                    | 2012   | 2013  | 2014 <sup>P</sup> | 2012    | 2013  | 2014 <sup>P</sup> |
| 2505.90 | Other natural sand | 8,459  | 6,036 | 4,849             | 13,601  | 7,136 | 7,012             |

Source: Department of Statistics

### Malaysia's exports of sand & gravel, by country

| Country  | 2012              |                | 2013              |                  | 2014 <sup>P</sup> |                  |
|--|-------------------|----------------|-------------------|------------------|-------------------|------------------|
|  | Quantity (tonnes) | Value (RM)     | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)       |
| <i>Sand &amp; Gravel<br/>(HS: 2505.90.000)</i> |                   |                |                   |                  |                   |                  |
| Taiwan   | –                 | –              | –                 | –                | 2,179             | 2,285,326        |
| Singapore                                      | 880               | 507,048        | 631               | 494,210          | 1,556             | 913,618          |
| Thailand                                       | 72                | 40,356         | 215               | 140,819          | 356               | 260,461          |
| Brunei   | 1,330             | 319,166        | 10,029            | 371,886          | 605               | 217,339          |
| Vietnam  | 14                | 9,720          | 73                | 66,462           | 227               | 187,135          |
| Others   | 72                | 60,036         | 2,152             | 538,206          | 151               | 124,705          |
| <b>Total</b>                                   | <b>2,368</b>      | <b>936,326</b> | <b>13,100</b>     | <b>1,611,583</b> | <b>5,074</b>      | <b>3,988,584</b> |

Source: Department of Statistics

## Malaysia's imports of sand &amp; gravel, by country

| Country                                       | 2012              |                   | 2013              |                  | 2014 <sup>p</sup> |                  |
|---|-------------------|-------------------|-------------------|------------------|-------------------|------------------|
|   | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)       | Quantity (tonnes) | Value (RM)       |
| <i>Sand &amp; Gravel</i><br>(HS: 2505.90.000) |                   |                   |                   |                  |                   |                  |
| India   | 1,544             | 3,491,495         | 2,042             | 1,962,451        | 1,941             | 2,600,847        |
| Germany                                       | 720               | 1,349,531         | 945               | 1,480,494        | 522               | 1,279,718        |
| Thailand                                      | 339               | 842,785           | 415               | 1,049,464        | 319               | 859,167          |
| China   | 896               | 2,443,415         | 887               | 651,950          | 1,438             | 760,801          |
| Australia                                     | 381               | 460,110           | 363               | 324,399          | 217               | 368,495          |
| Others  | 4,579             | 5,013,537         | 1,384             | 1,667,056        | 411               | 1,142,934        |
| <b>Total</b>                                  | <b>8,459</b>      | <b>13,600,873</b> | <b>6,036</b>      | <b>7,135,814</b> | <b>4,849</b>      | <b>7,011,962</b> |

Source: Department of Statistics

## Review

Sand and gravel are important raw materials used in the construction and infrastructure industries. The most important commercial sources of sand and gravel are from rivers, alluvium, offshore deposits and mine tailings.

Sand is used mainly as fine aggregates in concrete, mortar, cement bricks, filling and packing applications. Gravel is used mainly as coarse aggregates in concrete and also commonly used for road base. Offshore sand and gravel are often used for land reclamation.

In 2014, the total sand and gravel production was 29.9 Mt compared with 35.6 Mt in 2013. The production has decreased by 16.1% despite of high demand from the construction sectors. The major sand and gravel producing states were Perak (7.6 Mt), Johor (6 Mt), Selangor (5 Mt), Sarawak (3 Mt), Pahang (2.3 Mt), Kedah (2 Mt) and Negeri Sembilan (1.9 Mt).

During the year, there were 944 sand and gravel producers throughout the country compared with 930 in 2013. Perak has the highest number of 193 sand extraction permit holders and among others were Kedah (153) and Pahang (132). Pulau Pinang has its first production of sand and gravel in 2014 which amounted to 7,000 tonnes.

In 2014, the total exports of sand and gravel was 5,074 tonnes worth RM3.99 million compared with 13,100 tonnes worth RM1.61 in 2013. The main exports destinations were Taiwan, Singapore, Brunei, Thailand and Vietnam. Taiwan contributed most to the significant increase of export value in 2014 although the total exports volume during the same year decreased by 61.3%. The imports of sand and gravel also declined by 19.7% to 4,849 tonnes worth RM7.01 million from 6,036 tonnes worth RM7.13 million in the previous year. The main sources of imported sand and gravel were from India, China, Germany and Thailand. ■

## SILICA

### Malaysia's production of silica

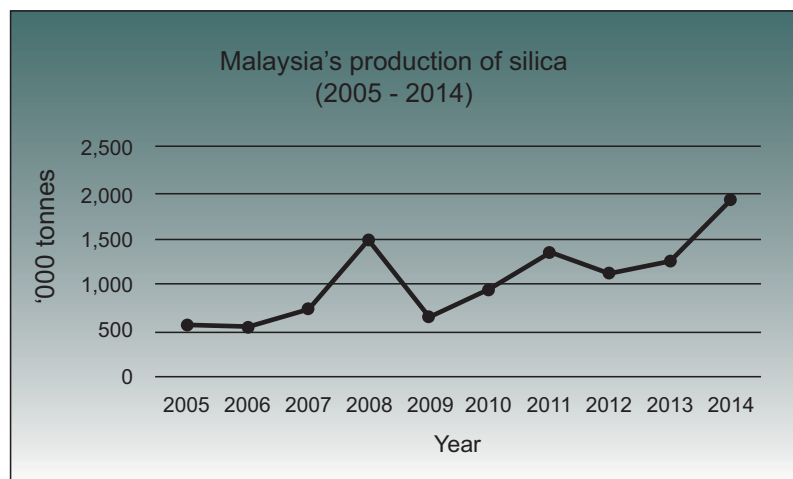
| State        | 2011             |           | 2012             |           | 2013             |           | 2014             |           |
|--------------|------------------|-----------|------------------|-----------|------------------|-----------|------------------|-----------|
|              | tonnes           | mines     | tonnes           | mines     | tonnes           | mines     | tonnes           | mines     |
| Perak        | 266,500**        | 18        | 313,145**        | 18        | 376,248          | 20        | 459,000          | 30        |
| Johor        | 973,040          | 8         | 574,070          | 11        | 655,924          | 11        | 1,252,240        | 15        |
| Sarawak      | 92,839           | 2         | 226,622          | 2         | 203,854          | 2         | 204,000*         | 2         |
| Selangor     | 7,634            | 1         | 6,069            | 1         | 7,634            | 1         | 7,634            | 1         |
| <b>Total</b> | <b>1,340,013</b> | <b>29</b> | <b>1,119,906</b> | <b>32</b> | <b>1,243,660</b> | <b>34</b> | <b>1,922,874</b> | <b>48</b> |

\* estimated

\*\* Included by-product from amang plants and tin mines

### Malaysia's historic production (silica)

| Year | tonnes    |
|------|-----------|
| 2005 | 542,297   |
| 2006 | 512,277   |
| 2007 | 719,221   |
| 2008 | 1,466,904 |
| 2009 | 630,394   |
| 2010 | 932,159   |
| 2011 | 1,340,013 |
| 2012 | 1,119,906 |
| 2013 | 1,243,660 |
| 2014 | 1,922,874 |



Note: Production includes silica sand and silica powder

## External Trade

### Exports

| H.S.    | Commodity             | tonnes  |         |                   | RM '000 |        |                   |
|---------|-----------------------|---------|---------|-------------------|---------|--------|-------------------|
|         |                       | 2012    | 2013    | 2014 <sup>P</sup> | 2012    | 2013   | 2014 <sup>P</sup> |
| 2505.10 | Silica & quartz sands | 370,989 | 390,758 | 543,254           | 29,518  | 44,600 | 46,793            |

### Imports

| H.S.    | Commodity             | tonnes |        |                   | RM '000 |        |                   |
|---------|-----------------------|--------|--------|-------------------|---------|--------|-------------------|
|         |                       | 2012   | 2013   | 2014 <sup>P</sup> | 2012    | 2013   | 2014 <sup>P</sup> |
| 2505.10 | Silica & quartz sands | 9,682  | 13,708 | 38,663            | 11,066  | 13,402 | 15,205            |

### Malaysia's exports of silica sand, by country

| Country                                | 2012              |                   | 2013              |                   | 2014              |                   |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|  | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        |
| Silica & quartz sands<br>(HS: 2505.10) |                   |                   |                   |                   |                   |                   |
| Singapore                              | 358,703           | 27,857,388        | 233,079           | 29,384,199        | 410,151           | 33,245,707        |
| ROK                                    | 286               | 373,268           | 53,101            | 4,773,658         | 72,691            | 7,211,345         |
| Philippines                            | 11,521            | 955,702           | 93,806            | 8,763,119         | 42,164            | 3,829,576         |
| Japan                                  | -                 | -                 | 9,900             | 1,089,000         | 17,145            | 2,026,063         |
| Vietnam                                | 285               | 191,894           | 460               | 278,511           | 406               | 234,877           |
| Others                                 | 194               | 139,785           | 412               | 311,821           | 698               | 245,624           |
| <b>Total</b>                           | <b>370,989</b>    | <b>29,518,037</b> | <b>390,758</b>    | <b>44,600,308</b> | <b>543,255</b>    | <b>46,793,192</b> |

### Malaysia's imports of silica sand, by country

| Country                                | 2012              |                   | 2013              |                   | 2014 <sup>P</sup> |                   |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|  | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)        |
| Silica & quartz sands<br>(HS: 2505.10) |                   |                   |                   |                   |                   |                   |
| Taiwan                                 | 3,585             | 5,025,239         | 8,282             | 6,425,709         | 23,450            | 7,729,453         |
| Australia                              | 2,615             | 1,447,639         | 2,841             | 2,703,849         | 2,278             | 1,285,712         |
| Belgium                                | 493               | 1,024,049         | 381               | 698,064           | 499               | 1,133,094         |
| Cambodia                               | -                 | -                 | -                 | -                 | 6,862             | 1,072,188         |
| Vietnam                                | 62                | 24,562            | 280               | 444,291           | 4,136             | 915,158           |
| Others                                 | 2,927             | 3,544,538         | 1,925             | 3,129,785         | 1,439             | 3,069,057         |
| <b>Total</b>                           | <b>9,682</b>      | <b>11,066,027</b> | <b>13,708</b>     | <b>13,401,698</b> | <b>38,663</b>     | <b>15,204,662</b> |

Source: Department of Statistics

**Price (per tonne)**

| Silica Sand  | 2011       | 2012       | 2013       | 2014       |
|--|------------|------------|------------|------------|
| <b>FOB Durban</b><br>Minus 20 micron, FCL, bagged<br>>92 brightness, | USD295     | USD295     | USD295     | USD295     |
| <b>Ex-works, USA</b><br>Glass sand, container                        | USD14 - 26 | USD14 - 26 | USD20 - 26 | USD20 - 26 |

Source: Industrial Minerals April 2014

**Review**

The term of silica is used to describe a mineral commodity which contains a high proportion of silica in the form of rock and sand. In Malaysia, the source of silica is solely from the silica sand mining. Most of the silica produced are from the mining of natural beach ridges, tin mine tailing sand and some from among retreatment plants. The silica sand is processed through various steps involving drying, screening, scrubbing, flotation, sizing, iron removal, grinding and acid leaching.

Malaysia has a large amount of silica sand resources. The Minerals and Geoscience Department Malaysia has estimated about 141.8 Mt of silica sand resources which occur throughout the country. The resources are located in Sarawak (45.7 Mt), Terengganu (45.6 Mt), Sabah (29.9 Mt), Perak (10.9 Mt), Selangor (8.4 Mt), Johor (1 Mt) and Kelantan (0.3 Mt). Besides silica sand, the department has also identified silica rock resources which are located in Negeri Sembilan (339.6 Mt), Terengganu (15.5 Mt), Selangor (6.7 Mt) and Perak (3 Mt).

In 2014, the number of silica sand producers in Perak, Johor, Sarawak and Selangor remained the same as in the previous year. In Sarawak, silica sand was produced from the mining of natural beach sand deposits while in Perak, Johor and Selangor it was

produced both from natural beach sand and tin mine tailing sand.

The total production of silica in 2014 increased significantly by 54.8%, from 1.2 Mt to 1.9 Mt worth at RM99.83 million. In 2014, silica production recorded the highest amount achieved since the last ten years. The production from Johor surged tremendously by 90.9% and contributed much to the total silica production. The bulk of the domestic silica produced went into the manufacturing of glass products. It was also consumed in ceramics, foundries, water treatment, glass wool and other related industries.

In 2014, export of silica sand increased by 39% to 543,254 tonnes worth RM46.79 million from 390,758 tonnes worth RM44.60 million in the previous year. Singapore remained the largest silica exports destination for the past three years. Other major exports countries in 2014 were ROK, Philippines, Japan and Vietnam. During the same period, Malaysia imported a total of 38,663 tonnes of silica sand which was valued at RM15.20 million, a tremendous increase from only 13,708 tonnes recorded in 2013. The imported silica sand was mainly from Taiwan and the other major sources were from Cambodia, Vietnam, Australia and Belgium. ■

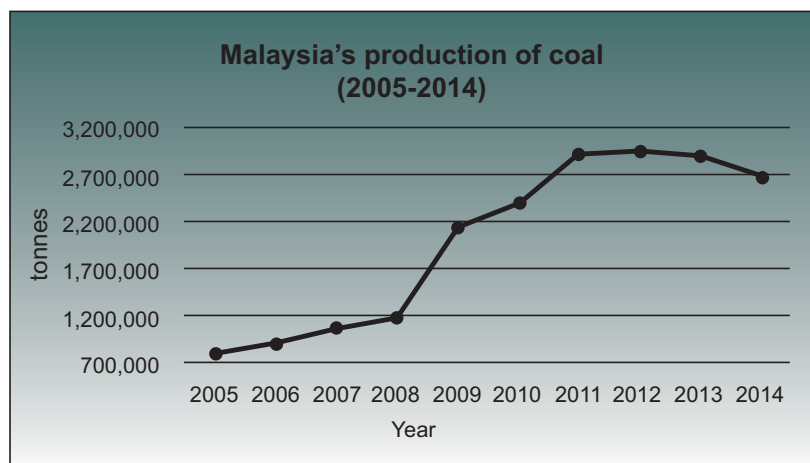
FOTO: ENERGY MINERALS



## COAL

### Malaysia's production of coal

| Year | tonnes    |
|------|-----------|
| 2005 | 789,356   |
| 2006 | 901,801   |
| 2007 | 1,063,078 |
| 2008 | 1,166,525 |
| 2009 | 2,138,390 |
| 2010 | 2,397,340 |
| 2011 | 2,915,788 |
| 2012 | 2,941,620 |
| 2013 | 2,893,963 |
| 2014 | 2,667,764 |



### External Trade

#### Exports

| H.S.        | Commodity                             | tonnes  |         |                   | RM '000 |        |                   |
|-------------|---------------------------------------|---------|---------|-------------------|---------|--------|-------------------|
|             |                                       | 2012    | 2013    | 2014 <sup>P</sup> | 2012    | 2013   | 2014 <sup>P</sup> |
| 2701.11.000 | Anthracite coal                       | 1,282   | 1,610   | 1,892             | 1,610   | 1,805  | 2,041             |
| 2701.12.000 | Bituminous coal                       | –       | –       | 33,027            | –       | –      | 4,441             |
| 2701.19.000 | Other coal                            | 299,684 | 528,968 | 257,087           | 58,520  | 98,897 | 48,792            |
| 2701.20.000 | Briquettes                            | –       | 403     | 26                | –       | 433    | 67                |
| 2702.10.000 | Lignite                               | 369,021 | 108,715 | 179,757           | 53,690  | 19,903 | 23,406            |
| 2704.00.100 | Coke and semi coke of coal            | 1,875   | 1,826   | 423               | 2,803   | 1,981  | 513               |
| 2704.00.200 | Coke and semi coke of lignite or peat | 29      | 43      | 39                | 62      | 70     | 45                |

## Imports

| H.S.        | Commodity                             | tonnes     |            |                   | RM '000   |           |                   |
|-------------|---------------------------------------|------------|------------|-------------------|-----------|-----------|-------------------|
|             |                                       | 2012       | 2013       | 2014 <sup>P</sup> | 2012      | 2013      | 2014 <sup>P</sup> |
| 2701.11.000 | Anthracite coal                       | 201,321    | 233,833    | 207,781           | 154,386   | 174,743   | 128,623           |
| 2701.12.000 | Bituminous coal                       | 4,382      | 982        | 422               | 4,614     | 1,118     | 496               |
| 2701.19.000 | Other coal                            | 20,801,342 | 22,710,439 | 21,123,794        | 6,502,487 | 5,664,966 | 4,998,205         |
| 2701.20.000 | Briquettes                            | –          | 645        | 141               | –         | 426       | 237               |
| 2702.10.000 | Lignite                               | 20         | 2          | 334               | 32        | 7         | 368               |
| 2704.00.100 | Coke and semi coke of coal            | 196,859    | 105,491    | 120,786           | 229,533   | 180,245   | 205,608           |
| 2704.00.200 | Coke and semi coke of lignite or peat | 4,314      | 200        | 825               | 5,578     | 196       | 1,440             |

Source: Department of Statistics

## Malaysia's exports of coal, by country

| Country                | 2012              |                   | 2013              |                    | 2014 <sup>P</sup> |                   |
|------------------------|-------------------|-------------------|-------------------|--------------------|-------------------|-------------------|
|                        | Quantity (tonnes) | Value (RM)        | Quantity (tonnes) | Value (RM)         | Quantity (tonnes) | Value (RM)        |
| <i>Coal (HS: 2701)</i> |                   |                   |                   |                    |                   |                   |
| Vietnam                | 102,582           | 18,375,213        | 106,103           | 17,224,855         | 134,447           | 26,186,097        |
| China                  | 128,207           | 27,569,801        | 363,600           | 71,980,926         | 92,532            | 18,880,620        |
| Indonesia              | 1,200             | 1,548,554         | 4,988             | 2,056,312          | 10,740            | 4,618,488         |
| India                  | -                 | -                 | 55,106            | 8,169,289          | 33,027            | 4,440,810         |
| Cambodia               | -                 | -                 | -                 | -                  | 30,108            | 3,725,394         |
| Others                 | 73,177            | 13,685,758        | 781               | 1,270,323          | 152               | 182,061           |
| <b>Total</b>           | <b>305,166</b>    | <b>61,179,326</b> | <b>530,578</b>    | <b>100,701,705</b> | <b>301,006</b>    | <b>58,033,470</b> |

104

## Malaysia's imports of coal, by country

| Country                | 2012              |                      | 2013              |                      | 2014 <sup>P</sup> |                      |
|------------------------|-------------------|----------------------|-------------------|----------------------|-------------------|----------------------|
|                        | Quantity (tonnes) | Value (RM)           | Quantity (tonnes) | Value (RM)           | Quantity (tonnes) | Value (RM)           |
| <i>Coal (HS: 2701)</i> |                   |                      |                   |                      |                   |                      |
| Indonesia              | 14,913,858        | 4,630,052,315        | 16,515,075        | 3,921,848,353        | 12,085,428        | 2,668,650,273        |
| Australia              | 2,778,961         | 1,000,583,648        | 3,824,284         | 1,072,428,550        | 5,659,671         | 1,445,943,791        |
| South Africa           | 3,119,100         | 874,705,643          | 1,797,391         | 506,259,577          | 1,760,062         | 443,973,593          |
| Russia                 | -                 | -                    | 437,829           | 135,567,238          | 1,416,620         | 386,858,166          |
| Vietnam                | 141,334           | 122,312,899          | 205,829           | 152,826,858          | 69,294            | 50,393,560           |
| Others                 | 65,503            | 37,286,744           | 173,030           | 54,609,226           | 343,351           | 1,32,451,081         |
| <b>Total</b>           | <b>21,018,756</b> | <b>6,664,941,249</b> | <b>22,953,438</b> | <b>5,843,539,802</b> | <b>21,334,426</b> | <b>5,128,270,464</b> |

Source: Department of Statistics

## World production of coal

| Country                      | tonnes               |                      |                      | % of 2013 <sup>p</sup> |
|------------------------------|----------------------|----------------------|----------------------|------------------------|
|                              | 2011                 | 2012                 | 2013 <sup>p</sup>    |                        |
| China                        | 3,520,000,000        | 3,660,000,000        | 3,680,000,000        | 46.55                  |
| USA                          | 970,745,546          | 950,467,534          | 949,100,000          | 12.00                  |
| India                        | 582,282,000          | 602,855,000          | 607,360,000          | 7.68                   |
| Australia                    | 416,733,000          | 450,124,000          | 477,000,000          | 6.03                   |
| Indonesia                    | 353,270,937          | 359,490,000          | 375,060,000          | 4.74                   |
| South Africa                 | 252,756,844          | 258,575,793          | 256,282,133          | 3.24                   |
| Kazakhstan                   | 116,449,000          | 120,528,000          | 119,860,000          | 1.52                   |
| Colombia                     | 85,803,229           | 89,024,321           | 85,496,062           | 1.08                   |
| Canada                       | 67,114,000           | 66,495,000           | 68,908,000           | 0.87                   |
| Czech Republic               | 57,815,000           | 54,506,000           | 49,195,000           | 0.62                   |
| Vietnam                      | 46,611,000           | 42,383,000           | 41,193,900           | 0.52                   |
| Korea, DPR                   | 41,000,000           | 41,492,000           | 41,000,000           | 0.52                   |
| Mongolia                     | 32,029,700           | 28,561,000           | 29,163,600           | 0.37                   |
| Thailand                     | 21,324,406           | 18,652,557           | 18,110,763           | 0.23                   |
| Mexico                       | 20,967,630           | 16,276,556           | 15,717,587           | 0.20                   |
| Philippines                  | 6,881,474            | 7,348,647            | 7,349,000            | 0.09                   |
| Brazil                       | 5,985,489            | 6,440,998            | 8,009,895            | 0.10                   |
| New Zealand                  | 4,944,700            | 4,926,200            | 4,625,400            | 0.06                   |
| <b>Malaysia*</b>             | <b>2,915,788</b>     | <b>2,951,124</b>     | <b>2,893,962</b>     | <b>0.04</b>            |
| Other countries              | 1,084,370,257        | 1,104,902,270        | 1,069,674,698        | 13.53                  |
| <b>World total (rounded)</b> | <b>7,690,000,000</b> | <b>7,886,000,000</b> | <b>7,906,000,000</b> |                        |

Source: BGS World Mineral Statistics 2009-2013

\* - Revised figures based on actual production

## Review

In Malaysia, the coal resources are found mostly in East Malaysia, in the states of Sarawak and Sabah. About 80% of the resources are in Sarawak, 19% in Sabah and 1% in Peninsular Malaysia. Malaysia's coal deposits ranges from lignite to anthracite with sub-bituminous and bituminous coal being more common. It is estimated that the total coal reserves is about 1,938 Mt, of which 281 Mt are classified as measured reserves, 378 Mt as indicated and another 1,279 Mt as inferred. The largest measured reserves of coal located in the Merit Pila coalfield, in Sarawak where 170 Mt of coal reserves had been identified. The development of local coal resources were not aggressively pursued because most of the deposits are located in the interior areas, which lack of infrastructure, and therefore uneconomic to be fully exploited. In Sabah, more than 72% of the resources are located in Maliau Basin Conservation Area, which was designated by the Sabah State Government as a Protection Class One Forest Reserve.

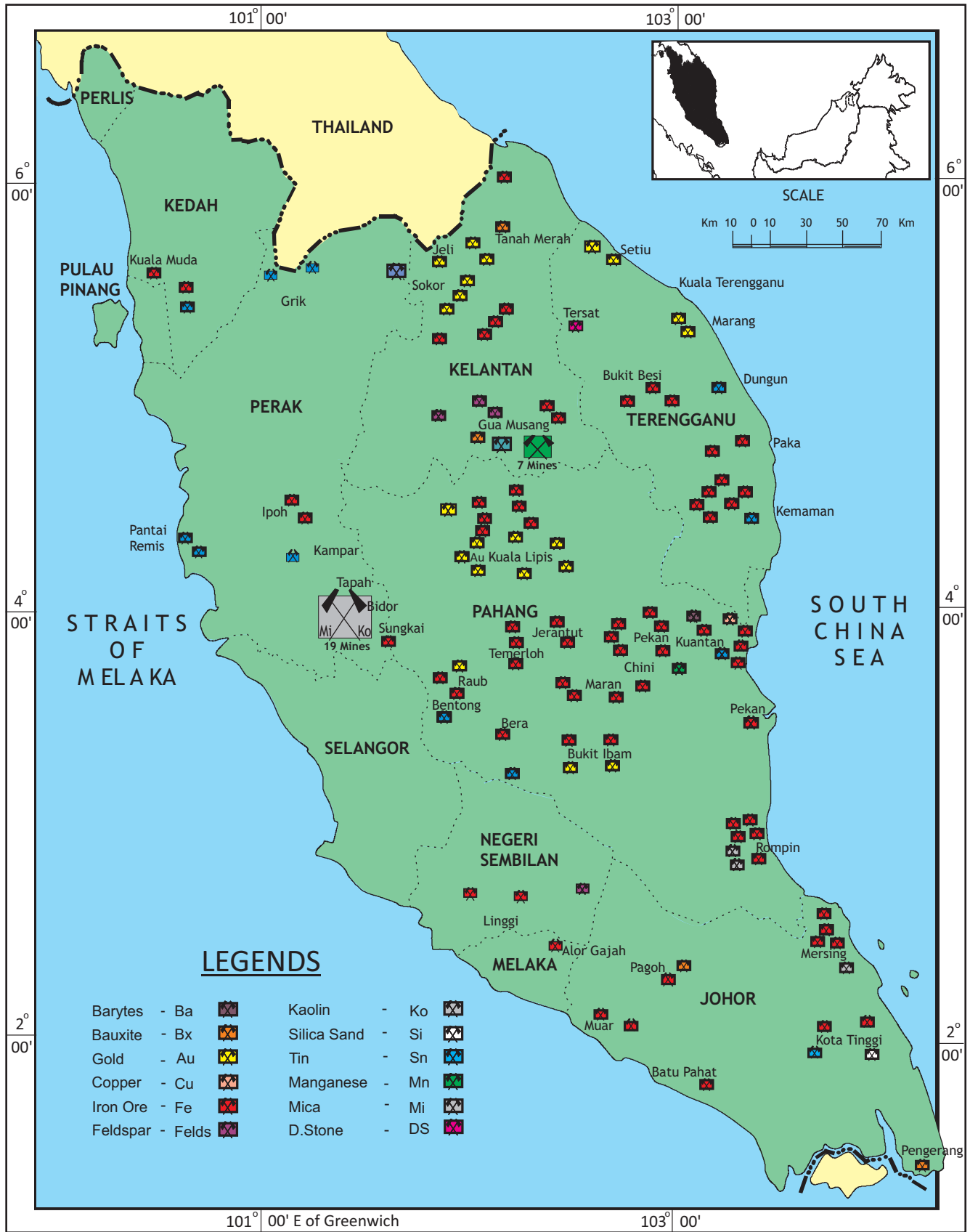
Currently, coal mining operates only in Sarawak. There were seven coal mines in operation during 2014. Annual production of coal in Malaysia has been on upward trend since 2004. However, in 2014 coal production decreased slightly by 7.61% to 2.67 Mt compared with 2.89 Mt recorded in 2013. Most of the coals produced are consumed by power generation plants besides cement, brick, iron and steel manufacturing industries.

At present, there are six coal-fired power generation plants in operation namely the Sultan Salahuddin Abdul Aziz Power Plant in Kapar, Selangor; the Janamanjung Power Plant in Manjung, Perak; Sejingkat Power Plant in Kuching, Sarawak; Mukah Coal Power Plant in Mukah Sarawak; SKS Tanjung Bin in Johor and Jimah Power Plant in Port Dickson, Negeri Sembilan. These power stations contribute about 27% of the total installed capacity of Malaysia's electricity power stations. Among the six power plants, two of them are using locally produced coal for their requirement. The percentage of coal consumption in Malaysia was 88% or 13,000 ktoe by power stations and the rest 12% by industries sector. The share available capacity from coal power plant is 30% from a total of 24,400 MW. In last three years, coal power plant contributed about 15,000 ktoe or 18% of primary energy supply of Malaysia (Malaysia Energy Statistics Handbook 2014).

In 2014, the total imports of coal decreased slightly by 8.7% to 21 Mt from 23 Mt recorded in 2013. The major sources of imported coal were from Indonesia, Australia and South Africa. Malaysia also exported some of its coal to China, Vietnam, India and Indonesia. In 2014, the total exports of coal decreased by 43.3% to 301,006 tonnes from 530,578 tonnes in the previous year. ■

foto: MINES IN 2013

## LOCATION OF MINES IN PENINSULAR MALAYSIA



# LOCATION OF MINES IN SARAWAK



## LIST OF OPERATING MINES IN MALAYSIA 2014

| Name   | Location                     | Mineral mined |
|--|------------------------------|---------------|
| <b>STATE : PAHANG</b>                        |                              |               |
| 1 MK Ria Sdn Bhd                             | Bukit Yon,Kuala Lipis        | Iron ore      |
| 2 Semantan Resources Sdn Bhd                 | Kerambit, Kuala Lipis        | Iron ore      |
| 3 Lanchang Mining Sdn Bhd                    | Sungai Teris,Temerloh        | Iron ore      |
| 4 Tajau Makmur Sdn Bhd                       | Bukit Tunggal,Maran          | Iron ore      |
| 5 Ibam Mining Sdn Bhd                        | Bukit Ibam,Rompin            | Iron ore      |
| 6 Ibam Mining Sdn Bhd (2)                    | Bukit Ibam,Rompin            | Iron ore      |
| 7 ZCM Resources Sdn Bhd                      | Sungai Piol, Jerantut        | Iron ore      |
| 8 Pacific Megalink Sdn Bhd                   | Keratong, Rompin             | Iron ore      |
| 9 Memori Bintang Sdn Bhd                     | Bukit Ketaya, Chini          | Iron ore      |
| 10 Alam Etika Sdn Bhd                        | Sungai Panching, Kuantan     | Iron ore      |
| 11 Mekar Unggul Sdn Bhd                      | Sungai Luit, Maran           | Iron ore      |
| 12 Menyata Natural Resources Sdn Bhd         | Sungai Perebuk, Chini        | Iron ore      |
| 13 Chini Highland Mining Resources Sdn Bhd   | Kampung Melai, Chini         | Iron ore      |
| 14 Esperance Mining Sdn Bhd                  | Tasik Biru, Bukit Ibam       | Iron ore      |
| 15 Edubest Resources Sdn Bhd (no.2)          | Sungai Kelubung, Kuala Lipis | Iron ore      |
| 16 Lanchang Mining Sdn Bhd (no.4)            | Bukit Sagu, Kuantan          | Iron ore      |
| 17 World Top Resources Mining Sdn Bhd        | Sungai Tamau, Lipis          | Iron ore      |
| 18 Jalur Galian Sdn Bhd                      | Kampung Baru, Jerantut       | Iron ore      |
| 19 Sinar Tani Sdn Bhd                        | Batu 4,Gambang, Segamat      | Iron ore      |
| 20 Victor Stone Sdn Bhd                      | Bukit Ketaya, Chini          | Iron ore      |
| 21 GE Mining Sdn Bhd                         | Sungai Besol, Jerantut       | Iron ore      |
| 22 HT Mines Sdn Bhd                          | Bukit Ibam, Rompin           | Iron ore      |
| 23 Gema Impak Sdn Bhd                        | Sungai Cipai, Rompin         | Iron ore      |
| 24 Everest Minerals & Mining Sdn Bhd         | Sungai Geroh, Rompin         | Iron ore      |
| 25 RK Sejiwa Wibawa (M) Sdn Bhd              | Bukit Ketaya, Chini          | Iron ore      |
| 26 Mega Well Mining Sdn Bhd                  | Sungai Tembi, Bera           | Iron ore      |
| 27 Axzonic Marketing Sdn Bhd                 | Bukit Ketaya, Chini          | Iron ore      |
| 28 Phoneix Lakel Sdn Bhd                     | Sungai Liut, Maran           | Iron ore      |
| 29 Spring Iron Sdn Bhd                       | Kampung Melaka, Rompin       | Iron ore      |
| 30 Wong Chong Me Mining Sdn Bhd              | Bukit Pesagi, Rompin         | Iron ore      |
| 31 New World High Tech Mining Sdn Bhd        | Selendang, Rompin            | Iron ore      |
| 32 Visinara Sdn Bhd                          | Sungai Ganoh, Rompin         | Iron ore      |
| 33 OTS Mining Sdn Bhd                        | Sungai Timun, Rompin         | Iron ore      |
| 34 YM Tg Nor Ashikin bt Sultan Sir Abu Bakar | Bukit Batu Putih             | Iron ore      |
| 35 YM Tg Nor Akemar bt Sultan Sir Abu Bakar  | Bukit Batu Putih             | Iron ore      |
| 36 Teknorat Engineering Sdn Bhd              | Kampung Baharu, Jerantut     | Iron ore      |
| 37 Safemine Minerals Sdn Bhd                 | Sungai Lik, Kuala Lipis      | Iron ore      |
| 38 Dato' Abdul Kadir Awang Kadir Sdn Bhd     | Sungai Jeram, Rompin         | Iron ore      |
| 39 Lmbg. Dato' Dr Hj Wahid bin Abdul Manap   | Sungai Renggoi, Chini        | Iron ore      |
| 40 Natural Mining Sdn Bhd                    | Bukit Ibam, Rompin           | Iron ore      |
| 41 Lambaian Belantara Sdn Bhd                | Bukit Tamar, Kuala Lipis     | Iron ore      |



| Name   | Location                     | Mineral mined |
|--|------------------------------|---------------|
| 42 Jaya Primalan Sdn Bhd                       | Bukit Batu Putih             | Iron ore      |
| 43 De' Raha Mining Sdn Bhd                     | Sungai Sepli, Jerantut       | Iron ore      |
| 44 Lmbg. YAM Tg Abdul Rahman                   | Penyor, Pekan                | Iron ore      |
| 45 Gainsources Mining Minerals S/B             | Bukit Gundal, Paloh Hinai    | Iron ore      |
| 46 J&F Reality S/B                             | Sungai Som, Jerantut         | Iron ore      |
| 47 Esperance Mining S/B (No.2)                 | Tasik Biru, Bukit Ibam       | Iron ore      |
| 48 Baiduri Jayamas S/B                         | Bukit Gondol, Pekan          | Iron ore      |
| 49 CKB Resources S/B                           | Sungai Keta, Raub            | Iron ore      |
| 50 Tamara East S/B                             | Bukit Pesagi, Bukit Ibam     | Iron ore      |
| 51 Miva Bina Consult. S/B                      | Bukit Sagu, Kuantan          | Iron ore      |
| 52 Cermat Aman S/B                             | Bukit Bekapor, Maran         | Iron ore      |
| 53 Ferro Me S/B                                | Sungai Ketapi, Maran         | Iron ore      |
| 54 Gainhill Agency & Consultancy Services S/B  | Bukit Gondol, Pekan          | Iron ore      |
| 55 Lanchang Mining S/B (No.2)                  | Kampung Luit, Maran          | Iron ore      |
| 56 J Resources Sdn Bhd                         | Penjom, Kuala Lipis          | Gold          |
| 57 Raub Australian Gold Mining Sdn Bhd         | Bukit Koman, Raub            | Gold          |
| 58 Selinsing Gold Mine Manager Sdn Bhd         | Sungai Kermoi, Kuala Lipis   | Gold          |
| 59 Yan Chan Kee Kim Mining Trading Sdn Bhd     | Sungai Penyadap, Kuala Lipis | Gold          |
| 60 HDL Global Sdn Bhd                          | Sungai Carah, Rompin         | Gold          |
| 61 Champmark Sdn Bhd                           | Sungai Timah, Kuala Lipis    | Gold          |
| 62 Pahang Ehsan (M) S/B721 Agenda Jitu Sdn Bhd | Sungai Jubau, Rompin         | Gold          |
| 63 Agenda Jitu Sdn Bhd                         | Pelangai, Bentong            | Tin ore       |
| 64 Rich Marvellous Sdn Bhd                     | Sg. Semantut, Bentong        | Tin ore       |
| 65 Metro Emerald Sdn Bhd                       | Sg. Lembing, Kuantan         | Tin ore       |
| 66 Ratna Putra Sdn Bhd                         | Sungai Timun, Rompin         | Tin ore       |
| 67 Myah Mines Sdn Bhd                          | Sungai Lembing, Kuantan      | Tin ore       |
| 68 Pekan Mining Sdn Bhd                        | Chini                        | Manganese ore |
| 69 RK Sejiwa Wibawa Sdn Bhd                    | Bukit Ketaya, Chini          | Manganese ore |
| 70 Memori Bintang Sdn Bhd                      | Chini                        | Manganese ore |
| 71 Vector Stone Sdn Bhd                        | Chini                        | Manganese ore |
| 72 Lmbg. Datu' Dr Hj Wahid Abd Manap           | Sungai Renggoi, Chini        | Manganese ore |
| 73 Chini Highland Mining Sdn Bhd               | Kampung Melai, Chini         | Manganese ore |
| 74 Sri Hisham Holding Sdn Bhd                  | Sungai Serai, Rompin         | Kaolin        |
| 75 Sri Hisham Holding Sdn Bhd (No.2)           | Sungai Serai, Rompin         | Kaolin        |
| 76 Cermat Aman Sdn Bhd                         | Bukit Bekapor, Maran         | Copper ore    |
| 77 Kreatif Selaras Mining S/B                  | Kota SAS, Kuantan            | Bauxite       |
| <b>STATE : PERAK</b>                           |                              |               |
| 1 Kaolin (M) Sdn Bhd                           | Sungai Jangka, Tapah         | Kaolin        |
| 2 Tinex Kaolin Corp. Sdn Bhd                   | Batang Padang, Tapah         | Kaolin        |
| 3 Asia Ceramic & Chemical Ind. Sdn Bhd         | Bidor Station, Bidor         | Kaolin        |
| 4 Foo Hoo Kaolin (M) Sdn Bhd                   | Tanah Mas, Bidor             | Kaolin        |
| 5 Forming Koalin (M) Sdn Bhd                   | Tanah Mas, Bidor             | Kaolin        |

| Name   | Location                        | Mineral mined |
|--|---------------------------------|---------------|
| 6 Kongsu Maju Sdn Bhd No.1                       | Tanah Mas, Bidor                | Kaolin        |
| 7 Kongsu Maju Sdn Bhd (2)                        | Tanah Mas, Bidor                | Kaolin        |
| 8 Kongsu Maju Sdn Bhd (3)                        | Tanah Mas, Bidor                | Kaolin        |
| 9 Lam Weng Hong & Rakan                          | Tanah Mas, Tapah                | Kaolin        |
| 10 Tinex Kaolin Corp. Sdn Bhd                    | Simpang Pulai, Ipoh             | Kaolin        |
| 11 Solid Kaolin Sdn Bhd                          | Tanah Mas, Bidor                | Kaolin        |
| 12 United Clay Product Sdn Bhd                   | Sg. Jangka, Tapah               | Kaolin        |
| 13 Seen Mee Clay Factory (M) Sdn Bhd             | Sg. Jangka, Tapah               | Kaolin        |
| 14 Techcera(M) S/B                               | Bidor Station, Bidor            | Kaolin        |
| 15 Uniteck Agency S/B                            | Tanah Emas, Bidor               | Kaolin        |
| 16 Rahman Hydraulic Tin Sdn Bhd                  | Klian Intan, Pangkalan Hulu     | Tin ore       |
| 17 Uniteck Agency Sdn Bhd                        | Kramat Pulai, Kinta             | Tin ore       |
| 18 Dollar Valley Sdn Bhd                         | Tg. Tualang, Batu Gajah         | Tin ore       |
| 19 HWG Tin Mining Sdn Bhd                        | Klian Intan, Pangkalan Hulu     | Tin ore       |
| 20 Kepayang Resources Sdn Bhd                    | Sungai Raja, Simpang Pulai      | Tin ore       |
| 21 Haji Abdullah Bin Haji Muhammad               | Manjung, Pantai Remis           | Tin ore       |
| 22 Andang Raya S/B                               | Batang Padang, Ulu Bernam Barat | Tin ore       |
| 23 Kota Baru Mining S/B                          | Teja, Kampar                    | Tin ore       |
| 24 Takuni S/B (kesuma Global S/B)                | Manjung, Pantai Remis           | Tin ore       |
| 25 Yayasan Kebajikan Islan Darul Ridzuan (KADIR) | Hulu Perak, Pengkalan Hulu      | Tin ore       |
| 26 Techcera (M) Sdn Bhd                          | Bidor Station, Bidor            | Mica          |
| 27 Tasik Mahir Sdn Bhd                           | Bidor Station, Bidor            | Mica          |
| 28 Perak Iron Mining Co Sdn Bhd                  | Sungai Rair, Simpang Pulai      | Iron ore      |
| 29 Abdul Rahman Bin Mahmud                       | Sungai Siput, Kuala Kangsar     | Iron ore      |
| 30 Koperasi kemajuan Tanah Perak Berhad          | Sungai Siput, Kuala Kangsar     | Iron ore      |
| <b>STATE : KELANTAN</b>                          |                                 |               |
| 1 YAKIN (Takrif Baru Sdn Bhd)                    | Relai, Chiku, Gua Musang        | Manganese ore |
| 2 YAKIN (Cetamin Cont Sdn Bhd)                   | Relai, Chiku, Gua Musang        | Manganese ore |
| 3 YAKIN (Ratusan Ardi Sdn Bhd)                   | Relai, Chiku, Gua Musang        | Manganese ore |
| 4 YAKIN (Jangka Bakat Sdn Bhd)                   | Relai, Chiku, Gua Musang        | Manganese ore |
| 5 YAKIN (Hajaria Sdn Bhd)                        | Sg. Aring, Chiku, Gua Musang    | Manganese ore |
| 6 YAKIN (Sunbay Resources S/B)-1                 | Sg. Aring, Chiku, Gua Musang    | Manganese ore |
| 7 YAKIN (Sunbay Resources S/B)-2                 | Sg. Aring, Chiku, Gua Musang    | Manganese ore |
| 8 YAKIN (Big Mountain Diversified S/B)           | Sg. Aring, Chiku, Gua Musang    | Manganese ore |
| 9 Iscorp S/B                                     | Sg. Aring, Chiku, Gua Musang    | Manganese ore |
| 10 FELDA (Interbumi Mining S/B)                  | Sg. Aring, Chiku, Gua Musang    | Manganese ore |
| 11 Hartawang Mining S/B                          | Sg. Aring, Chiku, Gua Musang    | Manganese ore |
| 12 Alam Tasik Mining S/B                         | Sg. Aring 6, Gua Musang         | Manganese ore |
| 13 PKINK (Kijang Barite Sdn Bhd)                 | Laloh, Gua Musang               | Barytes       |
| 14 PKINK (CMNM Mining Group Sdn Bhd)             | Sokor, Tanah Merah              | Gold          |
| 15 Perbadanan Men. Besar Kelantan Sdn Bhd        | Pergau, Jeli                    | Gold          |
| 16 Alaf Ideal S/B                                | Chiku, Gua Musang               | Gold          |
| 17 YAKIN (Kim San C.R Jaya Mining S/B)           | Perasu, Gua Musang              | Gold          |

| Name                                      | Location                    | Mineral mined |
|---|-----------------------------|---------------|
| 18 STL East Green S/B                     | Pergau, Jeli                | Gold          |
| 19 PKINK/Pulai Mining Sdn Bhd             | Kg. Tanah Putih, Gua Musang | Feldspar      |
| 20 Berkat Usaha Insan Sdn Bhd             | Kg. Tanah Putih, Gua Musang | Feldspar      |
| 21 Yayasan Kraftangan S/B                 | Tanah Putih, Gua Musang     | Feldspar      |
| 22 Yayasan Kraftangan S/B                 | Tanah Putih, Gua Musang     | Feldspar      |
| 23 WMZ Kraftangan Kelantan                | Galas, Gua Musang           | Feldspar      |
| 24 Perlombongan Gua Musang Sdn Bhd        | Bukit Tambun, Gua Musang    | Iron ore      |
| 25 Tekun Istimewa Sdn Bhd                 | Relai, Chiku, Gua Musang    | Iron ore      |
| 26 Interbumi Mining Sdn Bhd               | Bukit Kuang, Rantau Panjang | Iron ore      |
| 27 Ladang Ibu Sdn Bhd                     | Kuala Krai                  | Iron ore      |
| 28 Sungai Hijau Sdn Bhd                   | Sg Hau, Temangan            | Iron ore      |
| 29 Tanjung Krai Sdn Bhd                   | Batu Mengkebang, Kuala Krai | Iron ore      |
| 30 HYL Conctruction Sdn Bhd               | Pasir Genda, Tanah Merah    | Iron ore      |
| 31 Cuffland Resources Sdn Bhd             | Galas, Gua Musang           | Iron ore      |
| 32 Chang Farn Sheng Sdn Bhd               | Temangan, Machang           | iron ore      |
| 33 Intra Alliance & Consult               | Temangan, Machang           | iron ore      |
| 34 Pn Rohani binti Puteh                  | Bukit Kuang, Rantau Panjang | Iron ore      |
| 35 PTG Usaha Trading                      | Kerala, Tanah Merah         | Iron ore      |
| 36 PKINK (Nacstone Sdn Bhd)               | Galas, Gua Musang           | Iron ore      |
| 37 Pulai Jaya Trading Sdn Bhd             | Temangan, Machang           | Iron ore      |
| 38 NSA Integrity Sdn Bhd                  | Batu Mengkebang, Kuala Krai | Iron ore      |
| 39 Palamsel Holdings Sdn Bhd              | Kuala Krai                  | Iron ore      |
| 40 Goh Golden Mining Sdn Bhd              | Kerala, Tanah Merah         | Iron ore      |
| 41 KSK Sawmill Sdn Bhd                    | Belimbing, Jeli             | Iron ore      |
| 42 Bumi Bidari S/B                        | Belimbing, Jeli             | Iron ore      |
| 43 Interbumi Perfect Mining J.V S/B       | Jedok, Tanah Merah          | Iron ore      |
| 44 Interbumi Perfect Mining J.V S/B       | Bukit Kuang, Rantau Panjang | Iron ore      |
| 45 Gugusan Syabas S/B (Mine 1)            | Temangan, Machang           | Iron ore      |
| 46 Gugusan Syabas S/B (Mine 2)            | Temangan, Machang           | Iron ore      |
| 47 Astra Mahawangsa S/B                   | Alor Pasir, Pasir Mas       | Iron ore      |
| 48 Lintasan Unggul S/B                    | Sokor, Tanah Merah          | Iron ore      |
| 49 Neutraland Mining S/B                  | Sokor, Tanah Merah          | Iron ore      |
| 50 Bahatera Parmaslogam Rasharta (M) S/B  | Sokor, Tanah Merah          | Iron ore      |
| 51 YAKIN (Zulacco Mines S/B)              | Bertam, Gua Musang          | Tin ore       |
| 52 PKINK (CMNM Mining Group S/B)          | Sokor, Tanah Merah          | Silver        |
| 53 Kelstone S/B                           | Laloh, Gua Musang           | Lanthanum     |
| <b>STATE : TEREANGANU</b>                 |                             |               |
| 1 Koperasi Polis Terengganu Berhad        | Tebak dan Kemaman           | Iron ore      |
| 2 Lmbg. Telok Kalung Construction Sdn Bhd | Tebak dan Kemaman           | Iron ore      |
| 3 Lmbg. MKD Makmur Sdn Bhd                | Bandi, Kemaman              | Iron ore      |
| 4 Lmbg. Permint Mineral Sdn Bhd           | Bandi, Kemaman              | Iron ore      |
| 5 Lmbg. Bahtera Aizayuniex Sdn Bhd        | Chukai, Kemaman             | Iron ore      |
| 6 Harum Merdeka Sdn Bhd                   | Hulu Paka, Dungun           | Iron ore      |

| Name   | Location                      | Mineral mined   |
|--|-------------------------------|-----------------|
| 7 Lmbg. Wahaba Wangin Sdn Bhd                              | Jerangau, Dungun              | Iron ore        |
| 8 Lmbg. Cahaya Ikhtiar Sdn Bhd                             | Jerangau, Dungun              | Iron ore        |
| 9 TBM Mineral Sdn Bhd                                      | Jerangau, Dungun              | Iron ore        |
| 10 Lmbg. Marang Sekutu Sdn Bhd                             | Hulu Chukai, Kemaman          | Iron ore        |
| 11 Lmbg. Serijaya Kristal Sdn Bhd                          | Hulu Chukai, Kemaman          | Iron ore        |
| 12 Koperasi Polis Terengganu Berhad                        | Tebak dan Kemaman             | Iron ore        |
| 13 Lombong Besi Siti Rokiah                                | Kuala Paka, Dungun            | Iron ore        |
| 14 Lombong Jerangau Mining S/B                             | Jerangau, Dungun              | Iron ore        |
| 15 Lombong Ketengah Wira                                   | Bandi, Kemaman                | Iron ore        |
| 16 Lombong Besi Ngah Hamzah                                | Hulu Chukai, Kemaman          | Iron ore        |
| 17 Lombong Besi 60027 - LTAWNT                             | Besul, Dungun                 | Iron ore        |
| 18 Lombong Besi 110548 - LTAWNT                            | Jerangau, Dungun              | Iron ore        |
| 19 Lombong Besi 110549 & 60020 LTAWNT                      | Besul, Dungun                 | Iron ore        |
| 20 Lombong RISDA Terengganu                                | Hulu Paka, Dungun             | Iron ore        |
| 21 Lombong Zaira Abadi S/B                                 | Kerandand, Besut              | Iron ore        |
| 22 Reezan Plantation S/B                                   | Tebak, Kemaman                | Iron ore        |
| 23 Lombong Besi 60279 - LTAWNT                             | Tebak, Kemaman                | Iron ore        |
| 24 Lombong PML Ladang Rakyat                               | Bandi, Kemaman                | Iron ore        |
| 25 Lombong Besi Lot 791 & Lot 787                          | Hulu Chukai, Kemaman          | Iron ore        |
| 26 Lombong Emas -PERMINT (Sungai Kerak)                    | Sungai Kerak, Rusila          | Gold            |
| 27 Lombong Emas -PERMINT (Sungai Tapah)                    | Hulu Nerus, Setiu             | Gold            |
| 28 Lombong Emas - PERMINT (Sungai Tarom)                   | Hulu Setiu, Setiu             | Gold            |
| 29 Lombong Emas Cahaya Ikhtiar                             | Hulu Setiu, Setiu             | Gold            |
| 30 Lombong Emas -PERMINT (Lubuk Mandi)                     | Rusila, Marang                | Gold            |
| 31 Lombong Timah Induk Timur S/B                           | Tebak, Kemaman                | Tin ore         |
| 32 Lombong Timah AM Nusa S/B                               | Tebak, Kemaman                | Tin ore         |
| 33 Lombong Timah Sumacom Engineering S/B                   | Jengai, Dungun                | Tin ore         |
| 34 Lombong Pasir Silika - LTAWNT                           | Caluk, Setiu                  | Silica Sand     |
| 35 Lombong Lembaga Tabung Amanah Warisan Negeri Terengganu | Mukim tersat, Hulu Terengganu | Dimension Stone |
| <b>STATE : JOHOR</b>                                       |                               |                 |
| 1 Giant Distinction Sdn Bhd                                | Sungai Tengkil, Kota Tinggi   | Tin ore         |
| 2 Limemax Sdn Bhd  | Pelepah Kanan, Kota Tinggi    | Tin ore         |
| 3 Lembaga Kemajuan Johor Tenggara S/B                      | Sungai Tengkil, Kota Tinggi   | Tin ore         |
| 4 Limemax Sdn Bhd  | Pelepah Kanan, Kota Tinggi    | Iron ore        |
| 5 Waja Jati Sdn Bhd  | Jorak, Muar                   | Iron ore        |
| 6 Korporat Awal Sdn Bhd                                    | Jamaluang, Mersing            | Iron ore        |
| 7 Sokongan Semulajadi Sdn Bhd                              | Jemaluang, Mersing            | Iron ore        |
| 8 Sokongan Semulajadi Sdn Bhd                              | Felda Nitar 2, Mersing        | Iron ore        |
| 9 Usaha Padu Jati Enterprise Sdn Bhd                       | Bukit Kepong, Muar            | Iron ore        |
| 10 Bukit Kepong Mining Sdn Bhd                             | Felcra Bukit Kepong, Muar     | Iron ore        |
| 11 Generasi Karisma Sdn Bhd                                | Moakil, Muar                  | Iron ore        |

| Name  | Location                                    | Mineral mined |
|---|---|---------------|
| 12 D.Y.M.M Sultan Ibrahim Ibni Almarhum Sultan Iskandar   | Cha'ah, Batu Pahat                          | Iron ore      |
| 13 D.Y.M.M Sultan Ibrahim Ibni Almarhum Sultan Iskandar   | Ulu Sedilli, Kota Tinggi                    | Iron ore      |
| 14 D.Y.M.M Sultan Ibrahim Ibni Almarhum Sultan Iskandar   | Kg. Sayang, Kota Tinggi                     | Iron ore      |
| 15 Mados's Holding S/B  | Ulu Sedilli, Kota Tinggi                    | Iron ore      |
| 16 Hj. Masiran Elias  | Lenga, Muar                                 | Iron ore      |
| 17 D.Y.A.M Raja Muda Johor Tunku Ismail Ibni Sultan Ibrahim   | Pelepah Kanan, Kota Tinggi                  | Iron ore      |
| 18 D.Y.M.M Sultan Ibrahim Ibni Almarhum Sultan Iskandar   | Bukit Peta, Hutan Simpanan Labis            | Iron ore      |
| 19 Mr.Liang Shin Jiun   | Sedilli Besar, Kota Tinggi                  | Iron ore      |
| 20 Sarifah Mariam Binti Ali   | Jemaluang, Mersing                          | Iron ore      |
| 21 Amran Bin Abdul Aziz   | Kg.Gelang Chincin, Segamat                  | Iron ore      |
| 22 D.Y.M.M Sultan Ibrahim Ibni Almarhum Sultan Iskandar   | Jemaluang, Mersing                          | Iron ore      |
| 23 Y.A.M Tunku Temenggong Johor Tengku Idris Iskandar Ibni Sultan Ibrahim   | Tanjung Surat, Kota Tinggi                  | Iron ore      |
| 24 Jabatan kemajuan Orang Asli Malaysia   | Endau, Mersing                              | Iron ore      |
| 25 J-Bio Tech S/B   | Jorak, Muar                                 | Iron ore      |
| 26 Mior Group S/B   | Sungai Ambat, Mersing                       | Iron ore      |
| 27 Mustaji Bin Musran, Normadiah Binti Sulaiman, Nasir@Bakar Bin Ahmad, Nosiah Binti Kamar, Abd. Karim Bin Talib, Ngatiah Binti sarni | Jemaluang, Mersing                          | Iron ore      |
| 28 Sokongan Semulajadi Sdn Bhd  | Jemaluang, Mersing                          | Koalin        |
| 29 Sharifah Mariam Binti Ali  | Jemaluang, Mersing                          | Koalin        |
| 30 Johor Mining & Stevedoring Sdn Bhd   | Teluk Ramunia, Kota Tinggi                  | Bauxite       |
| 31 Giant Distinction Sdn Bhd  | Pengerang, Kota Tinggi                      | Silica Sand   |
| 32 Johor Mining & Stevedoring Sdn Bhd   | Teluk Ramunia, Kota Tinggi                  | Silica Sand   |
| <b>STATE : SARAWAK</b>  |   |               |
| 1 Luckyhill Coal Mining Sdn Bhd   | Abok, Sri Aman                              | Coal          |
| 2 Lucky Power Strategies Sdn Bhd  | Silantek, Sri Aman                          | Coal          |
| 3 Sarawak Coal Resources Sdn Bhd  | Bergih, Mukah                               | Coal          |
| 4 Sarawak Coal Resources Sdn Bhd  | Sg. Badengan Kanan & Sg. Belian Mati, Mukah | Coal          |
| 5 Sarawak Coal Resources Sdn Bhd  | Hulu Sg. Penipah, Mukah                     | Coal          |
| 6 Global Mineral (S) Sdn Bhd  | Tebulan, Kapit                              | Coal          |
| 7 Global Mineral Exploration Corp. Sdn Bhd  | Nanga Merit, Kapit                          | Coal          |
| 8 Syarikat Sebangun Sdn Bhd   | Ulu Linai, Miri                             | Silica sand   |
| 9 Syarikat Sebangun Sdn Bhd   | Bakkong, Miri                               | Silica sand   |

| Name                                   | Location                    | Mineral mined       |
|--|-----------------------------|---------------------|
| 10 Luckyhill Quarry Sdn Bhd            | Bau, Kuching                | Limestone (Calcium) |
| <b>STATE : KEDAH</b>                   |                             |                     |
| 1 LGK Resources Sdn Bhd                | Sungai Petani, Kuala Muda   | Iron ore            |
| 2 Besta Gold Resources Sdn Bhd         | Merbok, Kuala Muda          | Iron ore            |
| 3 Permodalan Kedah Berhad              | Gurun, Kuala Muda           | Iron ore            |
| 4 YIKED Holding Sdn Bhd                | Sungai Petani, Kuala Muda   | Iron ore            |
| 5 Hui Mah Resources Sdn Bhd            | Sungai Petani, Kuala Muda   | Iron ore            |
| 6 Alpha Gold Prop. Management Sdn Bhd. | Sungai Petani, Kuala Muda   | Iron ore            |
| 7 Enerindo Resources (M) Sdn Bhd       | Sungai Batu, Bandar Baru    | Iron ore            |
| 8 AA Info Jaya Sdn Bhd                 | Siong, Baling               | Iron ore            |
| 9 SP Mega Mineral Sdn Bhd              | Merbok, Kuala Muda          | Iron ore            |
| 10 Sistem Cemerlang Sdn Bhd            | Siong, Baling               | Iron ore            |
| 11 Magna Alliance (M) S/B              | Gurun, Kuala Muda           | Iron ore            |
| 12 Berlian Impresif S/B                | Sungai Petani, Kuala Muda   | Iron ore            |
| 13 Jelang Delima Sdn Bhd               | Temin, Kubang Pasu          | Tin ore             |
| 14 Perbadanan Menteri Besar Kedah      | Temin, Kubang Pasu          | Tin ore             |
| 15 Perbadanan Menteri Besar Kedah (2)  | Temin, Kubang Pasu          | Tin ore             |
| 16 Permodalan Kedah Berhad (PKB) No.2  | Serdang, Bandar Baru        | Silica Sand         |
| <b>STATE : NEGERI SEMBILAN</b>         |                             |                     |
| 1 Mok Yit Chek                         | Pasir Panjang, Port Dickson | Iron ore            |
| 2 Jlink Sdn Bhd                        | Lengong Hilir, Rembau       | Iron ore            |
| 3 Sri Alam Mining Sdn Bhd              | Linggi, Port Dickson        | Iron ore            |
| 4 Juta Omega Sdn Bhd                   | Pasir Panjang, Port Dickson | Iron ore            |
| 5 Alcamas Mining Sdn Bhd               | Gemencheh, Tampin           | Iron ore            |
| 6 Anugerah Berharga Sdn Bhd            | Gemencheh, Tampin           | Iron ore            |
| 7 Fadzil Bin Bandi                     | Si Rusa, Port Dickson       | Iron ore            |
| 8 E-Sing Plantation S/B                | Pasir Panjang, Port Dickson | Iron ore            |
| 9 Contemporary Tactics Sdn Bhd         | Tampin, Melaka              | Feldspar            |
| <b>STATE : NEGERI MELAKA</b>           |                             |                     |
| 1 Yayasan Negeri Melaka                | Kuala Sg. Baru, Alor Gajah  | Iron ore            |

Note: This list refers to Mining Lease