INDUSTRIAL PRODUCTION INDEX, MALAYSIA (2015=100)

1.	**Introduction**	The publication for reference month January 2018 is the first release using 2015 as the base year in the compilation of Industrial Production Index (IPI), Malaysia. The base year 2015 replaced the base year 2010 which has been used before. It is the ninth time rebasing of IPI has been done by the Department of Statistics, Malaysia.
		The IPI covers three major sectors namely Mining, Manufacturing and Electricity. This coverage is in line with the industrial sector definition in the International Recommendations for the Index of Industrial Production (IRIIP) 2010 issued by the United Nations.
2.	**Objective**	The main objective of the IPI is to measure the rate of change in the production of industrial commodities in real terms over time. Information from this short term indicators can be used to assist users in policy formulation and decision making.
3.	**The Purpose of Rebasing**	Rebasing is important to meet the demand needs for more accurate and reliable measurements. The rebasing and reweighting are conducted to ensure that:
		i. the scope and coverage of the index meet the needs of users;
		ii. the structure of the indices reflects the current activities of the industry; and
		iii. the weight used reflect the interests of the industry involved.
4.	**Data Sources for Rebasing**	Data from the Census of Mining and Quarrying and Census of Manufacturing Industries for reference year 2015 are used to rebase the IPI for the two sectors, while data from Tenaga Nasional Berhad (TNB) (including Independent Power Producers), Sabah lectricity Sdn. Bhd. (SESB) and Sarawak Energy Berhad (SEB) for the same reference year are used to update the IPI weights for the electricity sector.
5.	**Scope and Coverage**	The Mining sector covers the production of crude oil and natural gas which together accounted for 83.1% of the value of gross output and 89.6% of the census value added of the Mining sector in 2015.
		The Manufacturing sector covers the production of 245 industries of a total of 259 industries. These 245 selected industries covered 70 groups of industry. The selection of the industries and groups is based on their contributions to the Census value added of the Manufacturing sector in 2015. These selected industries accounted for 99.97% of the Census value added and 99.98% of the Value of gross output of the Manufacturing sector in 2015. They were in turn represented by the production of 879 products which accounted for 91.70% in terms of the total sales value of the Manufacturing sector. The main characteristic for selection of products for these industries are based on of their contributions to the total sales value of that particular industry.
		The electricity sector covers the generation of electricity by licensed plants to generate as well as to sell electricity. These plants accounted for 98.1% of the total electricity generated in 2015.

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6.   *Weights*   *The weights used for the computation of the IPI have been derived as follows:*

     i.   ***Sector Level***

     The weights are in proportion to the Mining, Manufacturing and Electricity sectors' respective contribution to the Gross Domestic Product (GDP) of Malaysia at current prices 2015; and

     ii.   ***Group and Industry Level***

     The weights are based on their proportion to the total census value added of the selected Groups and Industries in 2015. Within an industry, the weights of products have been determined on the basis of their proportion to the total sales value of that industry.

7.   *Sources of Monthly Data*   *Monthly data on the production of crude oil and natural gas are obtained from PETRONAS.*

Production data for 245 selected Industries in the Manufacturing sector are canvassed through the Monthly Manufacturing Survey where establishments with significant sales value are covered. Establishments with significant sales value are also covered purposively. Production data for the remaining three industries, namely crude palm oil, refined palm kernel oil and palm kernel oil are obtained from the Malaysian Palm Oil Board (MPOB).

Monthly data on the generation of electricity are obtained from Tenaga Nasional Berhad (TNB), Sabah Electricity Sdn. Bhd. (SESB) and Sarawak Energy Berhad (SEB).

8.   *Concepts and Definitions*   *The concepts and definitions used in this publication are defined in the Malaysia Standard Industrial Classification (MSIC) 2008 which adhere to that of the International Standard Industrial Classification Of All Economic Activities (ISIC), Rev. 4.*

Mining

Mining is part of the Category "Mining and Quarrying". It is defined as "extraction, dressing and beneficiating of minerals occurring naturally as solids such as coal and ores, liquids such as crude oil or gases such as natural gas. Extraction of minerals is undertaken by such processes as underground or open casting (open pit) mining, dredging, quarrying, the operation of wells or evaporation pans, or by recovery from ore dumps or tailings. All supplementary activities aimed at preparing the crude materials for marketing, done generally near or at the mine site as crushing, screening, washing, clearing, grading, milling, flotation, melting, pelleting, topping are also included".

Manufacturing

Manufacturing is defined as "the mechanical or chemical transformation of inorganic or organic substances into new products whether the work is performed by power driven machines or by hand, whether it is done by the factory or in the worker's home, and whether the products are sold at wholesale or retail". Assembly of the component parts of manufactured products is considered as manufacturing except in cases where the activity is appropriately classified under 'Construction'. Establishments primarily engaged in repair work are included and classified according to the type of product repaired.

Electricity

Electricity refers to "the generation, collection, transmission or distribution of electric energy for sale to household, industrial or commercial users".

Exports and Domestic Oriented Industries of Manufacturing Sector

The classification of export-oriented industry was determined using the threshold of value of exports exceeding 50 per cent of the sales value at aggregated of MSIC 3-digit and 2-digit while the industries which value of exports below the threshold are classified as domestic-oriented industry. The determination of classification was conducted using data from the Economic Census 2011, Economic Census 2016, Annual Economic Survey 2018 and Monthly External Trade statistics.

9. ***Reporting Unit*** *The reporting unit used in the survey was the establishment. An establishment is defined as "an economic unit engaged in one activity, under a single legal entity and operating in a single physical location". Each establishment was assigned an industry classification based on its principal activity. In the case of a multi-activity entity, units engaged in separate activities in the same location constituted distinct establishments. Thus, each branch of a multi-branch organization at a different location was conceptually treated as a different establishment. The establishment was requested to give separate returns for each activity in terms of value. However in practice, the accounts were centrally kept such that it was not possible to obtain separate data for each individual unit or branch. The entity or enterprise was treated as a single reporting unit and allowed to submit a consolidated questionnaire covering all the units or branches.*

10. ***Computational procedure*** *In general, the procedure used to derive the IPI is as follows:*

i. *computing the product relatives based on production data;*

ii. *computing industry indices based on the weighted arithmetic average of quantity relatives; and*

iii. *computing the indices for groups and for sectors based on the individual industry indices.*

The IPI compiled is a base year weighted arithmetic average of quantity relatives computed by the Laspeyres formula:

$$I_i \quad = \quad \frac{\sum R_i W_i}{\sum W_i}$$

Where:

I*i* *is the index for item 'i'*

R*i* *is the product relative for item 'i' for the reference month*

W*i* *is the base year weight for item 'i'*

The IPI is compiled at the sector (1-digit), industry (5-digit levels) and commodity (10-digit levels) for the Mining sector; sector (1-digit), division (2-digit levels), group (3-digit levels) and industry (5-digit) for the Manufacturing sector; and sector (1-digit) or the Electricity sector. In addition, an overall index for all the three sectors combined is also shown.

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11.	*Seasonal Adjustment*	*Time-series data are very useful for economists, policy & decision makers and time-series analysts to identify the important features of economic series such as direction, turning point and consistency between other economic indicators. Sometimes this feature is difficult to observe because of seasonal movements. Thus, if the seasonal effect can be removed, the behaviour of the series would be better viewed. The estimation and removal of the seasonal effects is called seasonal adjustment.*
		Seasonal adjustment is a process to identify and to remove the regular within a year seasonal pattern, which may also include the influences of moving holidays and working/trading days effect in each period. The ultimate objective of the process is to highlight the underlying trends and short-term movements in the series.
		In Malaysia, most of the time series data are affected by seasonal effects. Hence, to eliminate the seasonal effect as well as to seasonally adjust the Malaysian economic time series data, a standard seasonal adjustment package, X-12 ARIMA was used by Department of Statistics, Malaysia. Malaysian economic time series data also often affected by major religious festivals such as Eid-al Fitr for Muslims, Chinese New Year to the Chinese and the Indian Deepavali. These festivals' dates are fixed according to the lunar year but vary according to the Gregorian calendar. Therefore, to estimate and remove moving holiday effect from time-series data, a procedure was developed, namely Seasonal Adjustment for Malaysia (SEAM).
12.	*Linking Historical to the New Base year*	*The historical IPI are linked to the new base year to ensure there is a continuous time series for analysis purposes. This methodology has the advantageous that it preserves the year on year as well as the month on month growth rates for the newly linked series. The series are linked to the new series by normalizing them to the new base year using the formula:*

Linked index (based 2015)   =   index (based 2010) x factor

Where:

$$factor \; = \; \frac{annual\ index\ (based\ 2015)}{annual\ index\ (based\ 2010)}$$

13.	*Fequency of Compilation*	*The IPI is compiled for each calendar month while the quarterly and annual indices are computed from the monthly series.*
14.	*Confidentiality requirements*	*The data used for the compilation of IPI have been collected under the provisions of the Statistics Act 1965 (Revised-1989). The Act stipulates that the contents of individual return are confidential. In conformity with the stipulations of this Act, only aggregated figures are published.*
15.	*Revision*	*Revisions will be made to the published figures based on the latest data available.*
16.	*Symbols and abbreviations*	*-* *negative sign*
		n.e.c *not elsewhere classified*
		n.a *not available*