

**BAHAGIAN**  
*PART*

**3**

**NOTA TEKNIKAL**  
*TECHNICAL NOTES*







### A. INTRODUCTION

*This publication provides a statistics on production, sales, prices, exports and imports of crude oil & condensate and natural gas. In addition, macroeconomic indicators which include Gross Domestic Product (GDP), Industrial Production Index (IPI), Producer Price Index (PPI) as well as employment and labour productivity statistics are also reported to complete the statistics in this publication.*

### B. SOURCES OF STATISTICS

*Statistics obtained from Petroliaam Nasional Berhad (PETRONAS), Malaysia Thailand Joint Authority (MTJA) and statistics compiled by Department of Statistics Malaysia (DOSM).*

### C. CONCEPTS AND DEFINITIONS

*The concepts and definitions used are based on the International Recommendation for Industrial Statistics, 2008 by United Nations Statistics Division and the Joint Organisations Data Initiative (JODI). These concept are in accordance with the practices that have been adopted and thus facilitates the comparison of data internationally.*

*The definition of mining used is as follows:*

*“Mining is defined as the 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. Mining also includes underground and surface mines, quarries and wells and all supplemental activities for dressing and beneficiating ores and other crude minerals such as crushing, screening, washing, cleaning, grading, milling, flotation, melting, pelleting, topping and other preparations needed to render the material marketable. Mining activities are classified into groups on the basis of the principal mineral produced.”*

#### 1. Crude Oil

*A mixture of hydrocarbons that exist in liquid form in a natural underground reservoir and remain as a liquid at atmospheric pressure after going through the surface separation method.*

#### 2. Condensate

*Hydrocarbons are in the form of gases below the reservoir and turn into liquids when brought to the earth’s surface and are free from high temperatures and pressures.*

#### 3. Natural gas

*Natural gas is liquid or liquefied hydrocarbons recovered from natural gas in separation facilities or gas processing plants. Liquefied natural gas includes ethane, propane, butane (normal and iso-), (iso) pentane and pentanes plus (sometimes referred to as natural gasoline or plant condensate). Natural gas can be classified as follows:*

##### i. Associated gas

*Natural gas known as gas-caps are located above and along with the oil in the reservoir.*

##### ii. Non-associated gas

*Natural gas that is not mixed with crude oil in the reservoir.*



#### 4. **Liquefied Petroleum Gas (LPG)**

Liquefied petroleum gas (LPG) is the generic name for commercial propane and commercial butane. It can be produced from natural gas processing plants, oil refineries and in natural gas liquefaction plants.

LPG occurs naturally as gas at atmospheric pressure. It has the special property of becoming liquid at atmospheric temperature if moderately compressed and can easily be converted from liquid into gas by being released to atmospheric pressure. In order to facilitate transport and storage, LPG is usually bottled in liquid state (about 250 times more dense than in its gaseous form), propane however can also be supplied in bulk for storage tanks at consumers' premises.

LPG is used domestically, mainly for heating and cooking purposes and industrially for example as feedstock to the petrochemical industry. It is also increasingly used in the transport sector as vehicle fuel, because of its cleaner burning properties and often lower end-use price.

#### 5. **Natural Gas Liquid (NGL)**

Liquid or liquefied hydrocarbons recovered from gas separation plants and gas processing facilities.

#### 6. **Gasoline**

##### i. **Motor gasoline**

Motor gasoline is the principal fuel used in the transport/road sector and accounts for some 25 per cent of total oil use in the world.

Motor gasoline is a complex mixture of relatively volatile hydrocarbons used for spark-ignition internal combustion engines. Gasoline is produced in refineries as the result of primary distillation of crude oil and then further processing, including changing the molecular structure, until the required specifications are met. The characteristics of the gasoline produced depend on the type of crude oil that is used and the setup of the refinery at which it is produced.

Motor gasoline may include some quantities of additives and blending components to improve fuel properties such as octane number, stability and deposit formation in engines.

##### ii. **Aviation gasoline**

Aviation gasoline is a mixture of many different hydrocarbon compounds. The specification requirements for aviation gasoline, especially anti-knock, volatility, fluidity, stability, corrosiveness, and cleanliness impose severe limitations on the compounds that can be used.

#### 7. **Fuel Oil**

Fuel oil is a blended product based on the residues from various refinery distillation and cracking processes. It is a viscous liquid with a characteristic odour and it requires heating for storage and combustion. Fuel oil is used in medium to large industrial plants, marine applications and power stations in combustion equipment such as boilers, furnaces and diesel engines.



### 8. **Gas/diesel Oil**

Gas/diesel oil is a lighter fuel oil distilled off during the refining process and used primarily for heating, automotive purposes in diesel engines and for power generation. Two main types are distinguished by their uses:

#### i. **Transport diesel**

Fuel used for internal combustion in on-road diesel engines, cars, trucks and etc., usually of low sulphur content.

#### ii. **Heating oil and other gas oil**

This is a distillate fuel oil used mainly in stationary or marine diesel engines. It includes light heating oil which is used for residential or commercial space heating, or in industrial plants. It also includes marine diesel which is used for barge and boat engines and other heavier gas oils which may be used as petrochemical feed stocks.

### 9. **Blended Lubricating Oil**

Blended lubricating oil is hydrocarbons produced from distillate by product and they are mainly used to reduce friction between bearing surfaces. This category includes all finished grades of lubricating oil, from spindle oil to cylinder oil, and those used in grease, including motor oils and all grades of lubricating oil base stocks.

### 10. **Kerosenes**

#### i. **Kerosene type jet fuel**

This is a distillate used for aviation turbine power units. It has the same distillation characteristics between 150°C and 300°C (generally not above 250°C) and has flash point as kerosene. In addition, it has particular specifications (such as freezing point) which are established by the International Air Transport Association (IATA).

#### ii. **Other kerosene**

Medium distillation of oil between 150°C and 300°C, at least 65 per cent of the total distillation at 250°C. Its gravity is about 0.80 and the flash point is above 38°C. It is used as light and fuel in some types of spark-ignition engines, such as those used for agricultural tractors and stationary engines. Other names for this product are burning oil, vaporizing oil, power kerosene and illuminating oil.

### 11. **Naphtha**

Naphtha is a raw material used either for the petrochemical industry (e.g. ethylene production or aromatic production) or for the production of gasoline by reforming or isomerization processes in refining. Naphtha consists of substances in distillation stages of 30°C and 210°C or part of this interval.

### 12. **Weighted Average Lifting Price (WALP)**

Weighted Average Lifting Price (WALP) of Crude oil and condensate are gazetted prices.

### 13. **West Texas Intermediate (WTI) Crude Oil**

A crude stream produced in Texas and southern Oklahoma which serves as a reference or "marker" for pricing a number of other crude streams and which is traded in the domestic spot market at Cushing, Oklahoma.



**14. Brent Crude Oil**

*A blended crude stream produced in the North Sea region of United Kingdom which serves as a reference or "marker" for pricing a number of other crude streams.*

**15. Henry Hub**

*A pipeline hub on the Louisiana Gulf coast. It is the delivery point for the natural gas futures contract on the New York Mercantile Exchange (NYMEX).*

**16. Exports by Country of Destination**

*Goods (locally produced or manufactured or imported for subsequent re-exports) are regarded as exports when they are taken out of the country.*

*Exports are classified according to the country of destination, that is the country where it is expected that the goods will be consumed insofar as this can be ascertained at the time of export. In the case of goods shipped on an optional bill of lading, the country of the first port declared is taken as the country of destination. For goods exported via Singapore, if information regarding the country of destination of goods is not known/available, such exports are included under the value of exports to Singapore that is under the same category as goods consumed in Singapore.*

**17. Imports by Country of Origin**

*Goods are regarded as imports when they are brought into the country either directly or into bonded warehouses, irrespective of whether such goods are for consumption, to be processed, use in manufacturing or subsequent re-exports to other countries.*

*Imports are classified according to the country of origin of the goods, that is the country where the goods are given the final form in which they are imported into the country. For goods imported via Singapore, if information regarding the country of origin cannot be ascertained, such imports are included under the value of imports from Singapore, that is under the same category as goods produced/manufactured in Singapore.*

**18. Gross Domestic Product (GDP)**

*GDP is the total value of all goods and services produced in a certain period after deducting the cost of goods and services used up in the process of production. This value is before deducting the allowances for consumption of fixed capital i.e. the sum of value added of resident producer in producer's price plus import duties. GDP is equivalent to expenditure on the GDP (in purchaser's price) i.e. the sum of all components of final expenditure on goods and services less imports of goods and services.*

*GDP can be measured by using three approaches namely Production, Expenditure and Income Approach. However, the DOSM publication only presents Production and Expenditure Approach.*

**19. Industrial Production Index, Malaysia (2015=100)**

*Industrial Production Index, Malaysia(IPI) is to measure the rate of change in the production of industrial commodities in real terms over time. 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.*



### 20. **Producer Price Index Local Production (2010=100)**

Producer Price Index (PPI) local production is to measures the average changes in price of commodities charged by domestic producers of an industry. The PPI, which is an output-based index, is also a macroeconomic indicator used to monitor the price movements of local outputs and is often viewed as a leading indicator of Consumer Price Index.

### 21. **Persons Engaged**

All persons who, at any time during the reference week worked at least one hour for pay, profit or family gain either as an employer, employee, own-account worker or unpaid family worker. They are also considered as employed if they:

- i. Did not work during the reference week because of illness, injury, disability, bad weather, leave, labour dispute and social or religious reasons but had a job, farm, enterprise or other family enterprise to return to.
- ii. Were temporary laid-off with pay and would definitely be called back to work.
- iii. Were employed less than 30 hours per week during the reference week because of the nature of their work.
- iv. Were employed in the category of underemployment:
  - Time-related underemployment were a group of people who employed less than 30 hours during the reference week because of the nature of their work or due to insufficient work and are able and willing to accept additional hours of work.
  - Skill-related underemployment were those with tertiary education and working in the semi-skilled and low-skilled categories
  - Persons who were employed more than 30 hours during the reference week are considered to be in full employment.
- v. Person who works for pay or profit while on training or skills-enhancement activities required by the job or for another job for example those who follow Reskilling and Upskilling programs. This refers to the 19th International Conference of Labour Statisticians (ICLS).
- vi. Apprentices, interns or trainees who work for pay in cash or in kind such paid practical students. This also refers to the 19th ICLS.

### 22. **Category of Skill**

The category of skill is regrouped into three levels of skill as follows:

<b>Skill</b>	<b>MASCO 2013</b>
Skilled	1. Managers 2. Professionals
Semi-skilled	1. Clerical support workers 2. Service and sales workers 3. Skilled agricultural, forestry, livestock and fishery workers 4. Craft and related trades workers 5. Plant and machine operators and assemblers
Low-skilled	1. Elementary occupations



**23. Labour Productivity per Employment**

*Labour productivity per employment is measured as the ratio of output (goods and services) to input (employment).*

*It reflects the amount of output produced by each employee in full-time, part-time, or self-employed or unpaid family worker for at least one hour within a week. Employment refers to the overall number of employees at the end of the reference period.*

**24. Labour Productivity per Hour Worked**

*Labour productivity per hour worked is defined as the ratio of output (goods and services) to input (total working hours). It reflects the amount of output produced within an hour based on the category of employees either in full-time, part-time or self-employed or unpaid family worker who worked for at least one hour within a week.*

*Employment refers to the overall number of employees excluding the employees who did not work during the reference period because of illness, injury, disability, bad weather, leave, labour dispute and social or religious reasons.*

**D. CLASSIFICATION**

*The Classification of Mining and quarrying sector is based on Malaysia Standard Industrial Classification (MSIC) 2008 Ver. 1.0 (Refer Appendix).*

**E. REVISION**

*Revisions will be made to the published figures based on the latest data available.*





**Piawaian Klasifikasi Industri Malaysia, 2008 Ver. 1.0**  
*Malaysia Standard Industrial Classification 2008 Ver. 1.0*

<b>Kumpulan Group</b>	<b>Perkara Details</b>	<b>Keterangan</b>	<b>Description</b>
<b>051</b>		<b>Perlombongan batu arang pepejal</b>	<b>Mining of hard coal</b>
	05100	Perlombongan batu arang pepejal	Mining of hard coal
<b>052</b>		<b>Perlombongan lignit</b>	<b>Mining of lignite</b>
	05200	Perlombongan lignit (batu arang perang)	Mining of lignite (brown coal)
<b>061</b>		<b>Pengekstrakan petroleum mentah</b>	<b>Extraction of crude petroleum oils</b>
	06101	Pengekstrakan minyak petroleum mentah	Extraction of crude petroleum oils
	06102	Pengekstrakan bitumen atau minyak batu syal dan pasir tar	Extraction of bituminous or oil shale and tar sand
	06103	Pengeluaran petroleum mentah daripada batu syal dan pasir berbitumen	Production of crude petroleum from bituminous shale and sand
	06104	Proses mendapatkan minyak mentah	Processes to obtain crude oils
<b>062</b>		<b>Pengekstrakan gas asli</b>	<b>Extraction of natural gas</b>
	06201	Pengeluaran hidrokarbon mentah bergas (gas asli)	Production of crude gaseous hydrocarbon (natural gas)
	06202	Pengekstrakan kondensat	Extraction of condensates
	06203	Penyaliran dan pemisahan komponen hidrokarbon cecair	Draining and separation of liquid hydrocarbon fractions
	06204	Penyahsulfuran gas	Gas desulphurization
	06205	Perlombongan cecair hidrokarbon, diperoleh melalui pencairan atau penguraian kimia (pirolisis)	Mining of hydrocarbon liquids, obtain through liquefaction or pyrolysis
<b>071</b>		<b>Perlombongan bijih besi</b>	<b>Mining of ores</b>
	07101	Perlombongan bijih yang tinggi kandungan besi	Mining of ores valued chiefly for iron content
<b>072</b>		<b>Perlombongan bijih logam bukan besi (non-ferrous)</b>	<b>Mining of non-ferrous metal ores</b>
	07210	Perlombongan bijih uranium dan torium	Mining of uranium and thorium ores
	07291	Perlombongan bijih timah	Mining of tin ores
	07292	Perlombongan tembaga	Mining of copper
	07293	Perlombongan bauksit (aluminium)	Mining of bauxite (aluminium)
	07294	Perlombongan ilmenit	Mining of ilmenite
	07295	Perlombongan emas	Mining of gold
	07296	Perlombongan perak	Mining of silver
	07297	Perlombongan platinum	Mining of platinum
	07298	Pembilasan amang	Amang retreatment
	07299	Perlombongan bijih logam bukan besi lain	Mining of other non-ferrous metal ores n.e.c.



Piawaian Klasifikasi Industri Malaysia, 2008 Ver. 1.0  
Malaysia Standard Industrial Classification 2008 Ver. 1.0

Kumpulan Group	Perkara Details	Keterangan	Description
<b>081</b>		<b>Pengkuarian batu, pasir dan tanah liat</b>	<b>Quarrying of stone, sand and clay</b>
	08101	Pengkuarian, pemotongan kasar bongkah batu dan batu bangunan seperti marmar, granit (batu dimensi), batu pasir	Quarrying, rough trimming and sawing of monumental and building stone such as marble, granite (dimension stone), sandstone
	08102	Pengkuarian, penghancuran dan pemecahan batu kapur	Quarrying, crushing and breaking of limestone
	08103	Perlombongan gipsum dan anhidrit	Mining of gypsum and anhydrite
	08104	Perlombongan kapur dan dolomit yang tidak dirawat	Mining of chalk and uncalcined dolomite
	08105	Pengekstrakan dan penggorekan bagi industri pasir, pasir untuk sektor pembinaan dan kerikil	Extraction and dredging of industrial sand, sand for construction and gravel
	08106	Pemecahan dan penghancuran batu dan kerikil	Breaking and crushing of stone and gravel
	08107	Pengkuarian pasir	Quarrying of sand
	08108	Perlombongan tanah liat, refraktori tanah liat dan kaolin	Mining of clays, refractory clays and kaolin
	08109	Pengkuarian, penghancuran dan pemecahan granit	Quarrying, crushing and breaking of granite
<b>089</b>		<b>Perlombongan dan pengkuarian t.t.t.l</b>	<b>Mining and quarrying n.e.c</b>
	08911	Perlombongan fosfat semulajadi	Mining of natural phosphates
	08912	Perlombongan garam kalium (potassium) semulajadi	Mining of natural potassium saltes
	08913	Perlombongan sulfur semulajadi	Mining of native sulphur
	08914	Pengekstrakan dan penyediaan pirit dan pirotit, kecuali penyalaian	Extraction and preparation of pyrites and pyrrhotite, except roasting
	08915	Perlombongan barium sulfat semulajadi dan karbonat ( <i>barite and witherite</i> )	Mining of natural barium sulphate and carbonate (barytes and witherite)
	08916	Perlombongan borat semulajadi, magnesium sulfat semulajadi ( <i>kieserite</i> )	Mining of natural borates, natural magnesium sulphates ( <i>kieserite</i> )
	08917	Perlombongan earth colours, fluorspar dan mineral lain yang tinggi kandungan mineral sebagai sumber kimia	Mining of earth colours, fluorspar and other minerals valued chiefly as a source of chemicals
	08918	Perlombongan guano	Guano mining
	08921	Penggalian tanah gambut	Peat digging
	08922	Pengumpulan tanah gambut	Peat agglomeration
	08923	Penyediaan tanah gambut untuk pembaikan kualiti atau kemudahan pengangkutan atau penstoran	Preparation of peat to improve quality or facilitate transport or storage
	08931	Pengektrakan garam dari bawah tanah	Salt extraction from under ground
	08932	Pengeluaran garam melalui penyejatan air laut atau air masin lain	Salt production by evaporation of sea water or other saline waters
	08933	Penghancuran, penulenan dan penapisan garam oleh pengeluar	Crushing, purification and refining of salt by the producer



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**Malaysia Standard Industrial Classification 2008 Ver. 1.0**

<b>Kumpulan Group</b>	<b>Perkara Details</b>	<b>Keterangan</b>	<b>Description</b>
	08991	Perlombongan dan pengkuarian bahan pelelas (bahan kesat)	<i>Mining and quarrying of abrasive materials</i>
	08992	Perlombongan dan pengkuarian asbestos	<i>Mining and quarrying of asbestos</i>
	08993	Perlombongan dan pengkuarian fosil bersilika	<i>Mining and quarrying of siliceous fossil meals</i>
	08994	Perlombongan dan pengkuarian grafit semulajadi	<i>Mining and quarrying of natural graphite</i>
	08995	Perlombongan dan pengkuarian steatite	<i>Mining and quarrying of steatite (talc)</i>
	08996	Perlombongan dan pengkuarian batu permata	<i>Mining and quarrying of gemstones</i>
	08999	Perlombongan dan pengkuarian lain t.t.t.l	<i>Other mining and quarrying n.e.c.</i>
<b>091</b>		<b>Aktiviti perkhidmatan sokongan kepada pengekstrakan perlombongan dan pengkuarian</b>	<b>Support activities for mining and quarrying extraction</b>
	09101	Aktiviti pengekstrakan petroleum dan gas yang dibekalkan atas dasar kontrak atau yuran	<i>Oil and gas extraction service activities provided on a fee or contract basis</i>
	09102	Perkhidmatan memadam kebakaran di lapangan minyak dan gas	<i>Oil and gas field fire fighting services</i>
<b>099</b>		<b>Aktiviti sokongan perlombongan dan pengkuarian lain</b>	<b>Support activities for other mining and quarrying</b>
	09900	Aktiviti sokongan perlombongan dan pengkuarian lain	<i>Support activities for other mining and quarrying</i>
		<b>Pembuatan kok dan produk petroleum bertapis</b>	<b>Manufacture of coke and refined petroleum</b>
<b>192</b>		<b>Pembuatan produk petroleum bertapis</b>	<b>Manufacture of refined petroleum products</b>
	19201	Pembuatan produk petroleum bertapis	<i>Manufacture of refined petroleum products</i>
	19202	Pembuatan produk bio-diesel	<i>Manufacture of bio-diesel products</i>
		<b>Perdagangan borong kecuali kenderaan bermotor dan motosikal</b>	<b>Wholesale trade, except of motor vehicle and motorcycles</b>
<b>466</b>		<b>Lain-lain pengkhususan jual borong</b>	<b>Other specialized wholesale</b>
	46611	Jualan borong petrol, diesel, pelincir	<i>Wholesale of petrol, diesel, lubricants</i>
	46612	Jualan borong gas petroleum cecair	<i>Wholesale of liquefied petroleum gas</i>
	46619	Jualan borong bahan api pepejal, cecair dan gas dan produk berkaitan t.t.t.l.	<i>Wholesale of other solid, liquid and gaseous fuels and related products n.e.c.</i>
		<b>Perdagangan runcit kecuali kenderaan bermotor dan motosikal</b>	<b>Retail trade, except motor vehicles and motorcycles</b>
<b>473</b>		<b>Jualan runcit bahan api kenderaan di stor pengkhususan</b>	<b>Retail sale of automotive fuel in specialized stores</b>
	47300	Jualan runcit bahan api kenderaan di kedai khusus	<i>Retail sale of automotive fuel in specialized stores</i>