Malaysia Petrochemical Country Report 2015

Presented to

APIC – THE ASIA PETROCHEMICAL

INDUSTRY CONFERENCE

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CHAPTER ONE

MALAYSIAN ECONOMY

1.1 OVERVIEW OF THE MALAYSIAN ECONOMY IN 2015

Despite the challenging economic environment in 2015, the Malaysian economy registered a growth of 5.0% (2014: 6.0%), supported by the continued expansion of domestic demand. Domestic demand was primarily driven by the private sector. Modest improvements in external demand in the second half of the year also provided additional impetus to economic growth. Private consumption continued to expand, albeit at a more moderate pace as households adjusted their spending to the higher cost of living arising from the implementation of Goods and Services Tax (GST), adjustments in administrative prices, and the depreciation in the ringgit. Nevertheless, households received some support from the higher cash transfers under the Bantuan Rakyat 1Malaysia (BR1M) scheme, the reduction in individual income tax rates for the 2015 assessment year and savings derived from lower domestic fuel prices during the year. Household spending was also supported by continued income growth and stable labour market conditions. Public consumption recorded a sustained growth of 4.3% in 2015 (2014: 4.4%), reflecting the continued efforts by the Government to provide support to growth, while remaining committed to the steady reduction in the fiscal deficit.

During the year, the expansion in private investment was lower at 6.4% (2014: 11.0%), reflecting the moderation in domestic demand and cautious business sentiments. While investment in new oil and gas explorations moderated, overall private investment

continued to be supported by downstream oil and gas activities, and new and on-going projects in the manufacturing and services sectors. Public investment improved to register a smaller contraction of -1.0% (2014: -4.7%) as the Federal Government and public corporations continued to undertake capital spending, thus providing support to the economy.

All major economic sectors registered more moderate growth, with the exception of the mining sector. The moderation reflected the slower expansion of activity in industries catering to domestic demand. However, export-oriented manufacturing and trade-related services benefited from the modest improvement in external demand.

Labour market conditions remained broadly stable in 2015 as demand for labour was sustained by the continued expansion across all economic sectors. While the labour force participation rate was stable at 67.6% (2014: 67.5%), the unemployment rate edged higher to 3.2% (2014: 2.9%) as more cautious business sentiments led to softer employment prospects towards the second half of the year.

Headline inflation declined to 2.1% in 2015 (2014: 3.2%) as the impact of lower global energy and commodity prices more than offset the effects from a weaker ringgit exchange rate, the implementation of GST and several upward adjustments in administered prices. Despite the lower level of inflation during the year, price increases were more pervasive due to the implementation of GST, the weakening of the ringgit and the higher prices for fresh food. Headline inflation was also relatively more volatile in 2015 reflecting a series of adjustments in domestic fuel prices. Nevertheless, core inflation excluding GST

remained stable at 2.3% during the year (2014: 2.3%). The stability of core inflation was a reflection of the more moderate domestic demand conditions, the absence of excessive wage growth and the benign inflation globally.

1.2 TRADE PERFORMANCE IN 2015

Malaysia's total trade for 2015 grew by 1.2% to reach RM1.466 trillion, compared to RM1.448 trillion in the previous year. This was supported by stronger growth of 5.1% in the second half (H2) of 2015 following a negative growth of 2.8% in the first half (H1). This was the 9th year that trade had exceeded RM1 trillion.

The increase was contributed by higher trade with the People's Republic of China (PRC), which increased by RM23.09 billion, ASEAN (↑RM12.38 billion), the United States of America (USA) (↑RM12.22 billion), the European Union (EU) (↑RM4.52 billion), Turkey (↑RM2.48 billion), India (↑RM1.59 billion), Switzerland (↑RM1.46 billion), Taiwan (↑RM1.29 billion) and Mexico (↑RM1.15 billion).

Exports grew by 1.9% despite the challenging economic environment, to reach a value of RM779.95 billion. Exports during H2 2015 were resilient and turned around sharply to record a 6.8% growth from -3.1% recorded in H1 2015.

Imports increased by RM2.71 billion, a marginal growth of 0.4% to RM685.65 billion. Faster growth of exports in 2015 resulted in a higher trade surplus of RM94.29 billion, representing Malaysia's achievement of 18th consecutive year of trade surplus. The trade surplus registered a double-digit growth of 14.3%.

Major contributors to better export performance in 2015 were:-

- Manufactured goods which grew by 6.5%, offsetting the downturn in exports of commodities;
- Continued growth for electrical and electronics (E&E) exports driven by demand for new applications of internet of things (IoT) for wireless communications and wearable devices;
- Robust export growth registered to major trading partners, e.g. USA, PRC and EU.
- Exports to ASEAN increased by 2.8% with strong uptake by Thailand, Vietnam and the Philippines;
- Higher exports to Free Trade Agreements (FTA) partners; the PRC, Turkey, Chile and Pakistan;
- Higher uptake from Africa by 5.9%.

Trade with the FTA partner countries stood at RM927.66 billion with exports of RM492.41 billion while imports totalled RM435.25 billion. FTA partner countries contributed 63.1% of Malaysia's total exports in 2015. The main exports to the FTA partner countries in **2015** were E&E products, petroleum products, LNG, chemicals and chemical products, crude petroleum, manufactures of

metal, palm oil and palm-based products, machinery, appliances and parts, optical scientific and equipment as well as processed food. FTA partner countries which registered increases in exports were the PRC, Turkey, Chile, Pakistan, Thailand, Vietnam, the Philippines, Myanmar and Cambodia.

1.3 INVESTMENTS

Malaysia remained a competitive destination for long-term capital, as evidenced by the steady inflow of foreign direct investments (FDI). The bulk of the FDI flows went into the manufacturing sector, primarily in the electronics and electrical (E&E) and petrochemical-related industries. In 2015, Malaysia secured total approved investments amounting to RM186.7 billion in the manufacturing, services and primary sectors, a 21% decrease in value compared with RM235.9 billion in 2014. The investment performance in 2015 was strongly influenced by global economic headwinds exacerbated by the drop in oil and commodity prices, as well as the rise of the US dollar.

In 2015, some 4,887 projects approved. These are expected to create 180,240 new jobs, further bringing home the benefits of direct investments. Of the total investments approved, some RM150.6 billion or 80.7% was contributed by domestic investments (DDI) while RM36.1 billion or 19.3% came from foreign sources (FDI).

Malaysia's services sector maintains its momentum as the largest contributor to total approved investments in 2015. Nevertheless, on a year-on-year basis approved investments in the services sector last year contracted by 29.5%, which was mainly due to a sharp decline in the value of real-estate projects. Despite this, the value of investments contributed by key sub-sectors with relatively high value added activities such as health services, MSC Status companies and global establishments registered increases in investments.

The manufacturing sector remains important to Malaysia. In 2015, the manufacturing sector continued to attract a healthy share of capital intensive investments for flagship industries with a total of 680 new manufacturing projects with investments amounting to RM74.7 billion being approved as compared to 811 manufacturing projects with investments of RM71.9 billion approved in 2014. Full employment of these approved manufacturing projects will create 66,490 jobs of which 13,950 or 21% of these jobs are in the managerial, technical and supervisory (MTS) categories while 10, 230 or 15.4% will be skilled craft workers.

In terms of funding, foreign investments amounted to RM21.9 billion and the balance stemmed from domestic investments. The leading source of foreign investments in 2015 was the USA with investments totalling RM4.2 billion in 19 approved projects. The USA's RM2.1 billion expansion project for the manufacture of hard disk drives and media multi disk writers solidified its presence as the leading source of FDI. The USA was followed by Japan with investments amounting to RM4 billion in 60 projects. The bulk of Japan's investments was also concentrated on the E&E front.

The presence of multinational companies in Malaysia, particularly in the E&E sector is huge. Apart from contributing significantly to exports to the country, such establishments are also spawning the creation of high income, knowledge-driven job opportunities to Malaysians. As many MNCs in E&E undertake research and development (R&D) and design and development (D&D) as an integral component of their operations in Malaysia, this has spurred local companies to upscale their operations and are now undertaking their own internal R&D activities as part of the requirements in product and process development upon becoming part of these MNCs' supply chain network.

The new projects in 2015 bring the total number of manufacturing projects approved during the five-year period of 2011 to 2015 to 3,928 projects. Of these, 2,967 or 75.5% have been implemented thus far. Total capital investment in these projects amounted to RM175.1 billion. Another 773 projects are either at the site acquisition or in the active planning stages. The majority of projects implemented during the five-year period of 2011 to 2015 covered industries such as E&E, machinery & equipment petroleum products (incl. petrochemicals), transport equipment, fabricated metal products and chemicals and chemical products.

Investments in the primary sector registered a decrease of 96.2% from RM14.4 billion in 2014 to RM3.8 billion 2015. This is largely due to lower investments in oil and gas exploration activities, which resulted from the fall in oil prices that began in mid-2014.The rest of the investments in the primary sector, comprised of the plantation and commodities sub-sector and the agriculture sub-sector registered sustainable investments of RM712.2 million and RM261.2 million respectively.

1.4 ECONOMIC OUTLOOK FOR 2016

The Malaysian economy is expected to grow by 4.0 - 4.5% in 2016. Domestic demand will continue to be the principal driver of growth, sustained primarily by private sector spending. Private Consumption growth is expected to trend below its long-term average, reflecting largely the continued household adjustments to an environment of higher prices and greater uncertainties. These moderating effects, however, will be partially offset by continued growth in income and employment, as well as some support from Government

measures targeted at enhancing households' disposable income. In an environment of prolonged uncertainties and cautious business sentiments, private sector investment growth is projected to be slower compared to its performance in the past five years.

Capital expenditure in the upstream mining sector will continue to be affected by the environment of low energy and commodity prices. Support to private sector capital spending will mainly stem from the implementation of on-going and new investment projects, particularly in the manufacturing and Services sectors.

Reflecting the Government's commitment to more prudent spending, growth of public sector expenditure is also expected to be more moderate but would continue to be supportive of overall growth. Public investment is, however, projected to turn around to register a positive growth, reflecting higher spending by the Federal Government on fixed assets and the continued implementation of key infrastructure projects by public corporations. The external sector is expected to remain resilient in 2016. Despite subdued commodity prices, Malaysia's export performance is projected to remain positive, in line with the modest improvement in external demand. The well-diversified nature of Malaysia's exports will continue to support the overall growth in exports. Gross imports are projected to expand further amid an increase in intermediate imports to support the sustained performance of manufactured exports and the higher growth in capital imports due to continued expansion domestic private investment. The overall trade balance in 2016 is expected to continue to record a surplus, albeit one that is smaller. The services account is projected to record a narrower deficit on account of an expected improvement in tourism activity. Overall, the current account surplus is projected to narrow further to 1.0 - 2.0% of gross national income (GNI).

On the supply side, all economic sectors are projected to expand, albeit at a more moderate pace in 2016. The services and manufacturing sectors will remain the key drivers of overall growth. Despite the lower oil and gas prices, growth in the mining sector will be supported by new gas production capacity. Growth momentum in the construction sector is projected to moderate slightly in 2016 amid a modest expansion in both the residential and non-residential sub-sectors.

Headline inflation is projected to be higher at 2.5 - 3.5% in 2016 (*2015: 2.1%),* due mainly to increases in the prices of several price-administered items and the weak ringgit exchange rate. However, the impact of these cost factors on inflation will be mitigated by the low global energy and commodity prices, generally subdued global inflation and more moderate domestic demand. The trajectory of inflation during the year, however, could be more volatile given the uncertainties relating to global oil and commodity prices as well as the pace of global growth.

1.5 MALAYSIA – KEY ECONOMIC INDICATORS

Malaysia - Key Economic Indicators

	2013	2014	2015p	2016f
Population (million persons)	30.2	30.6	31.0	31.4
Labour force (million persons)	13.6	14.0	14.2	14.6
Employment (million persons)	13.2	13.5	13.8	14.1
Unemployment (as % of labour force)	3.1	2.9	3.2	3.3 – 3.5
Per Capita Income (RM)	32,596	34,945	36,285	37,930
(USD)	10,345	10,677	9,291	8,821
NATIONAL PRODUCT (% change)				
Real GDP at 2010 prices[1]	4.7	6.0	5.0	4.0 – 4.5
(RM billion)	955.3	1,012.5	1,062.6	1,106.1
Agriculture, forestry and fishery	1.9	2.1	1.0	-0.3
Mining and quarrying	1.2	3.3	4.7	3.5
Manufacturing	3.4	6.2	4.9	4.1
Construction	10.8	11.8	8.2	7.9
Services	6.0	6.5	5.1	4.4
Nominal GNI	5.3	8.6	5.2	5.9
(RM billion)	984.8	1,069.3	1,124.7	1,191.0
Real GNI	5.2	6.0	6.8	3.8
(RM billion)	916.9	971.9	1,038.1	1,077.7
Real aggregate domestic demand[2]	7.3	5.9	5.1	4.3
Private expenditure	8.5	7.9	6.1	5.2
Consumption	7.2	7.0	6.0	5.1
Investment	12.8	11.0	6.4	5.5
Public expenditure	4.1	0.4	2.1	1.6
Consumption	5.9	4.4	4.3	2.0
Investment	1.9	-4.7	-1.0	1.1
Gross national savings (as % of GNI)	30.4	30.3	28.8	28.3
BALANCE OF PAYMENTS (RM billion)				
Goods balance	96.6	113.4	108.9	99.5
Exports	637.7	679.9	685.8	707.6
Imports	541.1	566.5	576.9	608.1
Services balance	-9.6	-11.2	-20.5	-19.2
Primary Income, net	-34.0	-37.3	-32.2	-38.0
Secondary Income, net	-17.5	-17.6	-22.2	-23.1
Current account balance	35.5	47.3	34.0	19.1
(as % of GNI)	3.6	4.4	3.0	1.0 – 2.0
Bank Negara Malaysia International reserves, net[3]	441.9	406.3	409.1	-
(In months of retained imports)	9.5	8.3	8.4	-
PRICES (% change)				
CPI (2010=100)[4]	2.1	3.2	2.1	2.5 – 3.5
PPI (2010=100)[5]	-1.7	1.4	-4.8	-
Real wage per employee in the manufacturing sector	5.8	1.5	3.7	-

[1] Beginning 2015, real GDP has been rebased to 2010 prices, from 2005 prices previously
[2] Exclude stocks
[3] All assets and liabilities in foreign currencies have been revalued into ringgit at rates of exchange ruling on the balance sheet date and the gain/loss has been reflected accordingly in the Bank's account
[4] Effective 2011, the Consumer Price Index has been revised to the new base year 2010=100, from 2005=100 previously
[5] Effective 2015, the Producer Price Index has been revised to the new base year 2010=100, from 2005=100 previously
[6] Based on average USD exchange rate for the period of January-February 2016
p Preliminary
f Forecast
Note: Numbers may not necessarily add up due to rounding

Source: Department of Statistics, Malaysia and Bank Negara Malaysia

Source: BNM & DOS

CHAPTER TWO

PETROCHEMICAL INDUSTRY IN MALAYSIA

2.1. OVERVIEW

Malaysia has the world's 16th largest natural gas reserves and 28th largest crude oil reserves. Malaysia also has the world's largest production facility at a single location of liquefied natural gas with production capacity of 25.7 million metric tonnes per year.

The long term reliability and security of gas supply ensures the sustainable development of the country's petrochemical industry. The existence of a trans-peninsular gas transmission pipeline system and six gas processing plants, has resulted in a ready supply of gas to the industry.

To complement the existing gas reserves and to ensure further security of gas supply, Malaysia has forged partnerships with other ASEAN members for the supply of gas such as Vietnam, Indonesia and the Malaysia-Thailand Joint Development Area (JDA). In addition, gas supply will be further enhanced with the implementation of the ASEAN gas grid, a venture to make gas available to all the 10 ASEAN countries.

The full implementation of AFTA has seen petrochemical manufacturers in Malaysia benefiting from a single and bigger market. Malaysia's Free Trade Agreements with China, India, Turkey and other major trading partners also opened up new business opportunities for petrochemicals manufacturers in Malaysia.

The presence of world renowned petrochemical companies, such as Shell, BASF, Eastman Chemicals, Toray, Mitsubishi, Idemitsu, Polyplastics, Kaneka, Dairen and Lotte

speaks clearly of Malaysia's potential as an investment location for petrochemical industries. Most of these companies are working in collaboration with Malaysia's national petroleum company, PETRONAS.

Three major petrochemical zones have been established in Kertih, Terengganu; Gebeng, Pahang; and Pasir Gudang/Tanjung Langsat, Johor. Each zone is an integrated complex with crackers, syngas and aromatics facilities to produce feedstocks for downstream products. There are also other petrochemical plants in Malaysia such as the ammonia and urea plants in Bintulu, Sarawak and Gurun, Kedah; acrylonitrile butadiene styrene plant in Pulau Pinang; methanol plant in Labuan and the nitrile-butadiene rubber plant in Kluang, Johor. oving forward, a new petrochemical zone will be established in Pengerang, Johor. These projects are being planned to be operational by 2019.

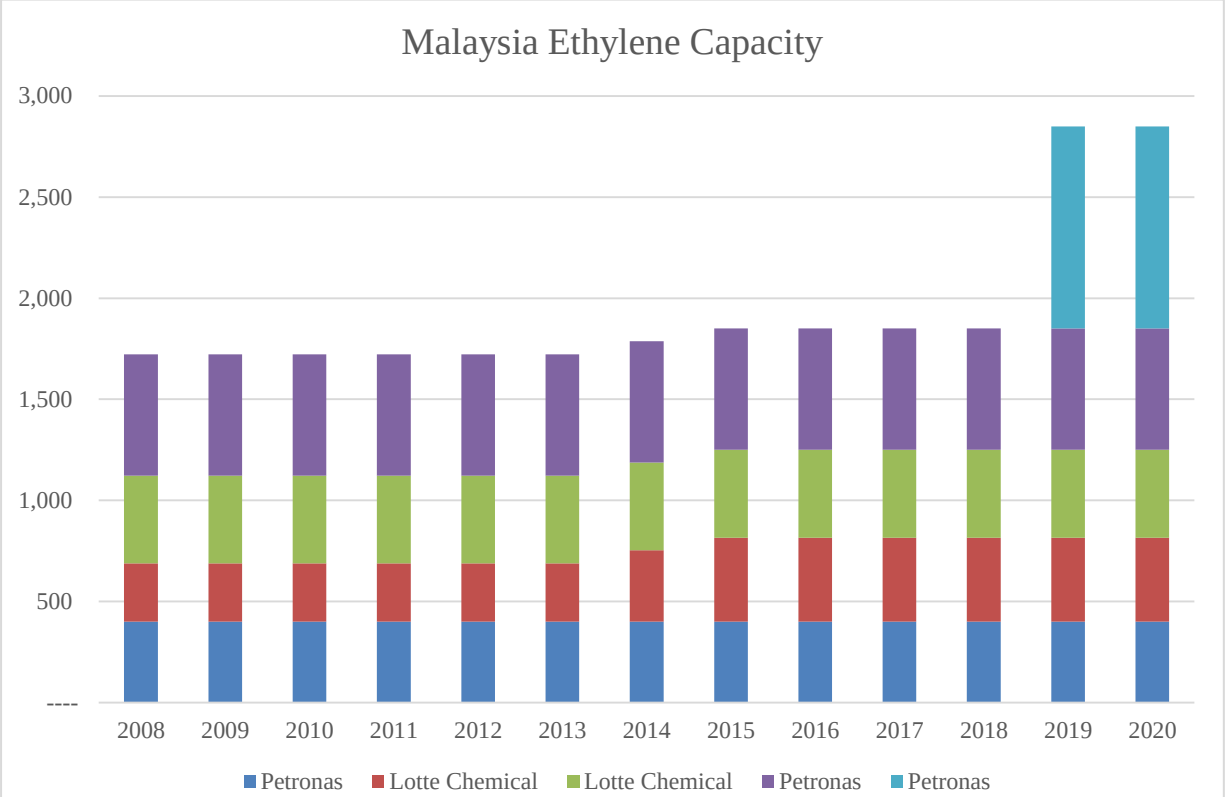
Malaysia is an exporter of major petrochemical products. A wide range of petrochemicals are produced in Malaysia such as olefins, polyolefins, aromatics, ethylene oxides, glycols, oxo-alcohols, , acrylic acids, phthalic anhydride, acetic acid, styrene monomer, high impact polystyrene, ethyl benzene, vinyl chloride monomer and polyvinyl chloride and polybutylene terephthalate. These world scale plants have also contributed significantly to the development of local downstream plastic processing activities by providing a steady supply of feedstock material for the plastic industry.

Petronas Chemical Group’s (PCG) Sabah Ammonia Urea (SAMUR) Project in Sipitang, Sabah, is currently underway and is slated for commercial operations in second half of 2016. The world class project will propel PCG to be the second largest urea producer in South East Asia. The completion of the Dalak pipeline project in December 2015 will

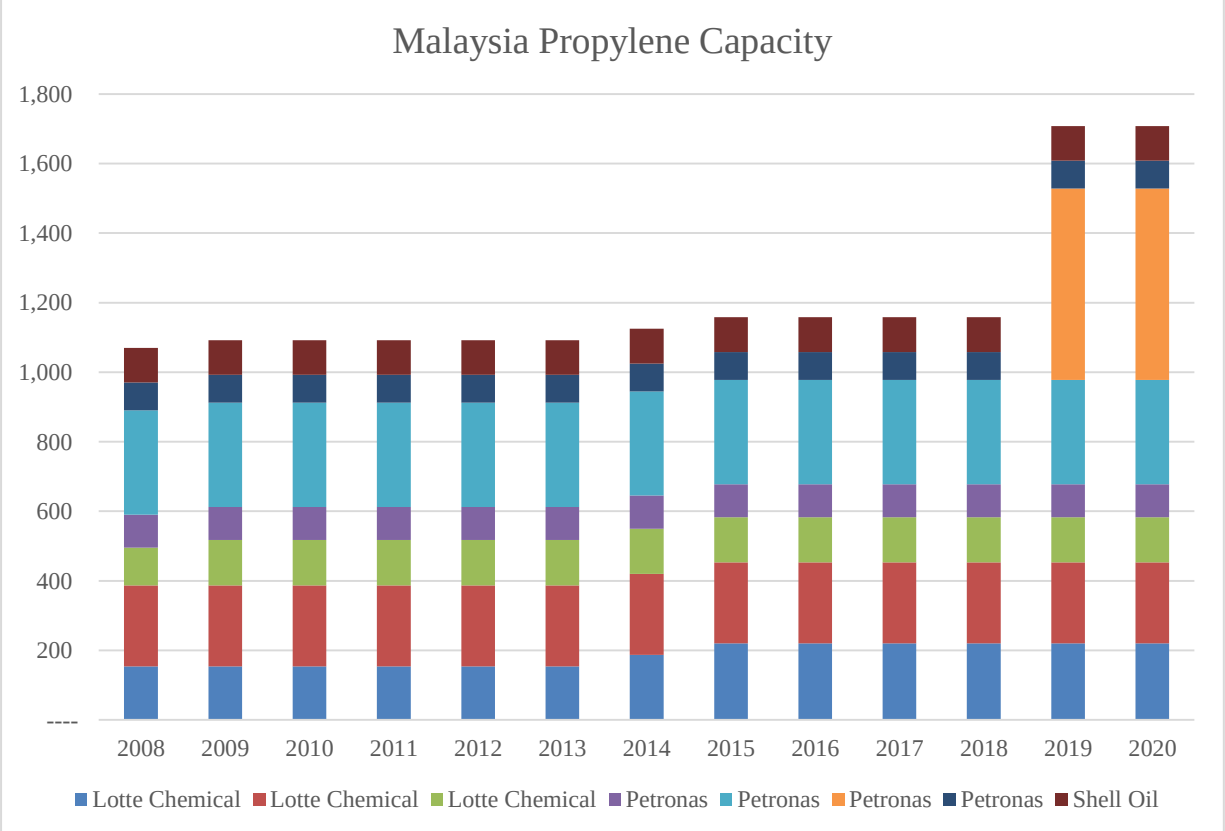
also improve the feedstock availability to PCG's Methanol Complex in Labuan and further strengthen the company's feedstock security.

In 2015, PCG announced their participation in the Refinery and Petrochemical Integrated Development (RAPID) Petrochemical Projects. With the acquisition of the three petrochemical clusters in RAPID Project, namely PRPC Polymers Sdn Bhd, PRPC Glycols Sdn Bhd and PRPC Elastomers Sdn Bhd, we are set to consolidate our position as a key petrochemical player in the Asia Pacific region. The acquisition of the three petrochemical clusters will provide PCG a total of 3.5 million metric tons per annum (mtpa) of nameplate capacity that will increase PCG's Olefins & Derivatives segment nameplate capacity by 70%. With the product portfolio, comprising basic commodity and differentiated petrochemicals, the project is very much in line with PCG's two-prong strategy of strengthening basic petrochemicals and selective diversification into derivatives, specialty chemicals and solutions.

As for specialty chemicals, PCG is currently undertaking three key projects via their associate company BASF PETRONAS Chemicals Sdn Bhd in Gebeng,Pahang. The three projects are the Integrated Aroma Ingredients Complex, which will produce citral, citronellol and L-menthol; the 2-Ethylhexanoic Acid (2-EH Acid) Project; and the Highly Reactive Poly-Isobutene (HR-PIB) Project. All three projects are reported to be on schedule. Citral, the first product of the Integrated Aroma Ingredients Complex, will be on stream for commercial operations along with 2-EH Acid in 2016, while the HR-PIB Project, is scheduled for commercial operations in 2017.


Malaysia Ethylene Capacity
3,000
2,500
2,000
1,500
1,000
500

2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Petronas
Lotte Chemical
Lotte Chemical
Petronas
Petronas


Malaysia Propylene Capacity
1,800
1,600
1,400
1,200
1,000
800
600
400
200

2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
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2020
Lotte Chemical
Lotte Chemical
Lotte Chemical
Petronas
Petronas
Petronas
Petronas
Shell Oil

2.2 PLASTICS INDUSTRY

The availability of raw materials in Malaysia has led the plastic products industry to become one of the most dynamic industries in Malaysia's manufacturing sector. The plastic industry can be divided into four sub-sectors, namely packaging sub-sector, electrical & electronics and automotive components sub-sector, consumer and industrial products sub-sector and others. The packaging sub-sector, both flexible and rigid (including bags, films, bottles and containers), remains the largest market for the plastic industry. The main production processes involved in the plastic producers industry are injection moulding, pipes and profiles extrusion and foam moulding.

There are more than 1,300 companies in operation, producing products ranging from common household items, packaging materials and conveyance articles to parts and components for the electrical and electronics, automotive, office automation, computer and telecommunications industries. Malaysia is currently a net exporter of plastic products. The main products exported were plastic containers, plates, films, sheets, foils, strips and other articles of plastics. The main export destinations included the EU, the People's Republic of China, Hong Kong, Singapore, Japan and Thailand.

	2011	**2012**	**2013**	**2014**	**2015**
Number of plastics manufacturers	1,400	1,350	1,350	1,300	1,300
Employment	74,000	74,000	76,000	82,000	80,000
Turnover	RM16.25b (+2.1%)	RM17.16b (+6.5%)	RM17.94b (+4.5%)	RM19.46 (+7.3%)	*RM24.77 (+27.3%)
Export	RM10.15b (+6%)	RM10.05b (-1%)	RM10.69b (+6.4%)	RM11.94b (+11.5%)	RM12.96b (+8.5%)
% of export against turnover	62%	59%	60%	62%	52%
Resin consumption	1.98m MT (+5%)	2.04m MT (+3%)	2.10m MT (+3%)	2.15m MT (2.5%)	2.22m MT (3%)
Per capita consumption of resin	68kg	69kg	70kg	70kg	71kg

Source: MPMA & DOS

CHAPTER THREE

Committee Reports

3.1. GENERAL MATTERS & RAW MATERIALS COMMITTEE

Recent Developments in Malaysia and its Industry Outlook in the coming years

Subsequent to the Bursa Malaysia announcement made on 3 November 2015 on the acquisition from PETRONAS Refinery and Petrochemical Corporation Sdn Bhd (PRPC), a wholly owned subsidiary of Petroliam Nasional Berhad (PETRONAS), the entire equity in three (3) companies, namely PRPC Glycols Sdn Bhd, PRPC Polymers Sdn Bhd and PRPC Elastomers Sdn Bhd ("Project Companies"), which are part of the Refinery and Petrochemicals Integrated Development (RAPID) project in Johor Malaysia , PCG wishes to announce that it will not proceed with the proposed elastomers project in RAPID.

The decision was based on a review which was conducted on various key aspects of the elastomers project, including the product's market outlook and project return on investment. The project cancellation is expected to improve the overall returns of PCG's investments.

As per the 3 November 2015 announcement, the initial total projected investment cost for the polymers, glycols and elastomers segments was approximately USD3.9 billion with a combined capacity of 3.5 million metric tons per annum (mtpa). The cancellation of the elastomers project will result in capacity reduction of 0.35 million mtpa and projected investment cost by USD1.3 billion.

PCG remains committed to the rest of the petrochemical projects that it had undertaken, namely the polymers and glycols projects. The cancellation of the elastomers project is not expected to have any impact on the commencement date for PRPC Polymers and PRPC Glycols which is scheduled to start in 2019.

Sources: Announcement in Bursa Malaysia

NAMEPLATE CAPACITY	2013	2014	2015	2016	2017	2018	2019	2020
ABS Resins	350	350	350	350	350	350	350	350
Ethylene	1723	1,723	1723	1723	1723	1723	1723	2723
Expandable Polystyrene	0	0	0	0	0	0	0	0
High Density Polyethylene	485	585	585	585	585	585	585	585
Linear Low Density Polyethylene	100	0	0	0	0	0	0	0
Low Density Polyethylene	485	485	485	485	485	485	485	485
Polypropylene	373	373	373	373	373	373	373	373
Polystyrene	110	110	110	110	110	110	110	110
Polyvinyl Chloride	125	110	110	110	110	110	110	110
Styrene	240	240	240	240	240	240	240	240
Vinyl Chloride Monomer	0	0	0	0	0	0	0	0
Grand Total	**3991**	**3,976**	**3976**	**3976**	**3976**	**3976**	**3976**	**4976**

IMPORTS	2013	2014	2015	2016	2017	2018	2019	2020
ABS Resins	46	44	61	66	66	71	61	61
Ethylene	40	31	16	11	11	11	11	1
Expandable Polystyrene	27	26	27	27	28	29	29	30
High Density Polyethylene	206	231	9	41	62	91	101	330
Linear Low Density Polyethylene	320	400	425	450	475	501	523	366
Low Density Polyethylene	132	136	131	131	131	131	131	131
Polypropylene	250	244	241	251	251	261	271	201
Polystyrene	56	59	60	59	58	56	56	56
Polyvinyl Chloride	192	207	211	211	216	221	231	231
Styrene	144	121	111	111	111	121	121	131
Vinyl Chloride Monomer	61	76	79	92	96	103	101	97
Grand Total	**1474**	**1,575**	**1371**	**1450**	**1505**	**1596**	**1636**	**1635**

EXPORTS	2013	2014	2015	2016	2017	2018	2019	2020
ABS Resins	196	197	221	231	238	241	237	234
Ethylene	150	129	81	111	121	101	101	101
Expandable Polystyrene								
High Density Polyethylene	180	196						475
Linear Low Density Polyethylene								61
Low Density Polyethylene	398	399	382	339	323	318	315	418
Polypropylene	191	179	131	121	96	81	81	401
Polystyrene	53	55	56	56	56	54	51	51
Polyvinyl Chloride	37	37	36	39	39	41	41	31
Styrene	76	63	46	41	41	41	41	41
Vinyl Chloride Monomer								
Grand Total	**1281**	**1,255**	**953**	**938**	**914**	**877**	**867**	**1813**

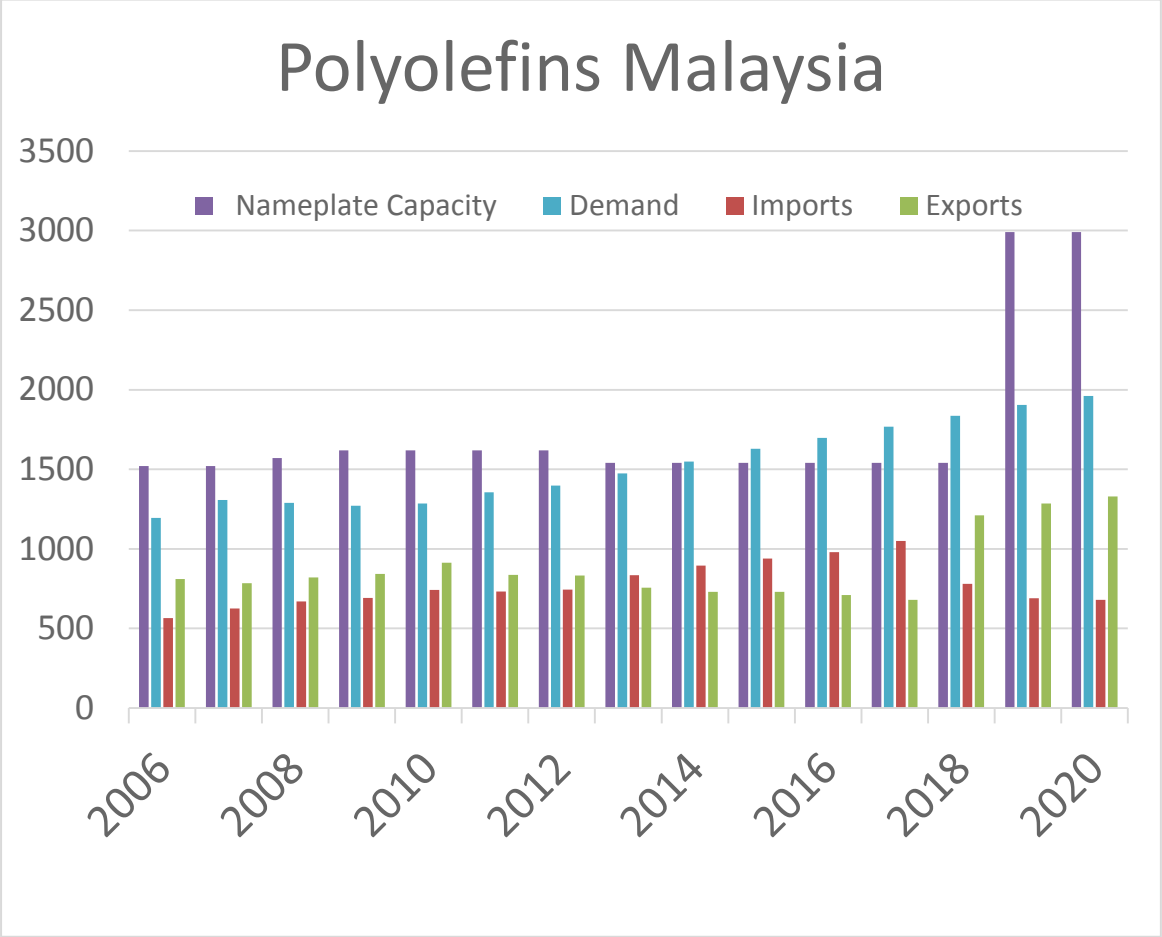
3.2. POLYOLEFINS COMMITTEE

Malaysia was a net exporter of polyolefin products ending in 2013. The major export destinations were China (including Hong Kong), and countries in the South East Asia region and India Sub-Continent. However, due to Petronas subsidiary Polypropylene Malaysia mothballing its 80,000 tons/year PP plant in Kuantan, Malaysia at the end of December 2012 and capacity reduction at the second producer Lotte Chemical Titan from 480 to 400 kta in 2013 Malaysia became net polypropylene importer.

Indeed, Lotte Chemical Titan remains the only active PP capacity in Malaysia until Petronas brings its new RAPID petrochemical project on-line. Lotte Chemical Titan total PP capacity now stands at 400,000 tons/year. Petronas' new RAPID project will house a 300,000 barrels/day refinery, a naphtha cracker with a combined olefins capacity of 3 million tons/year as well as other petrochemical and polymer units.

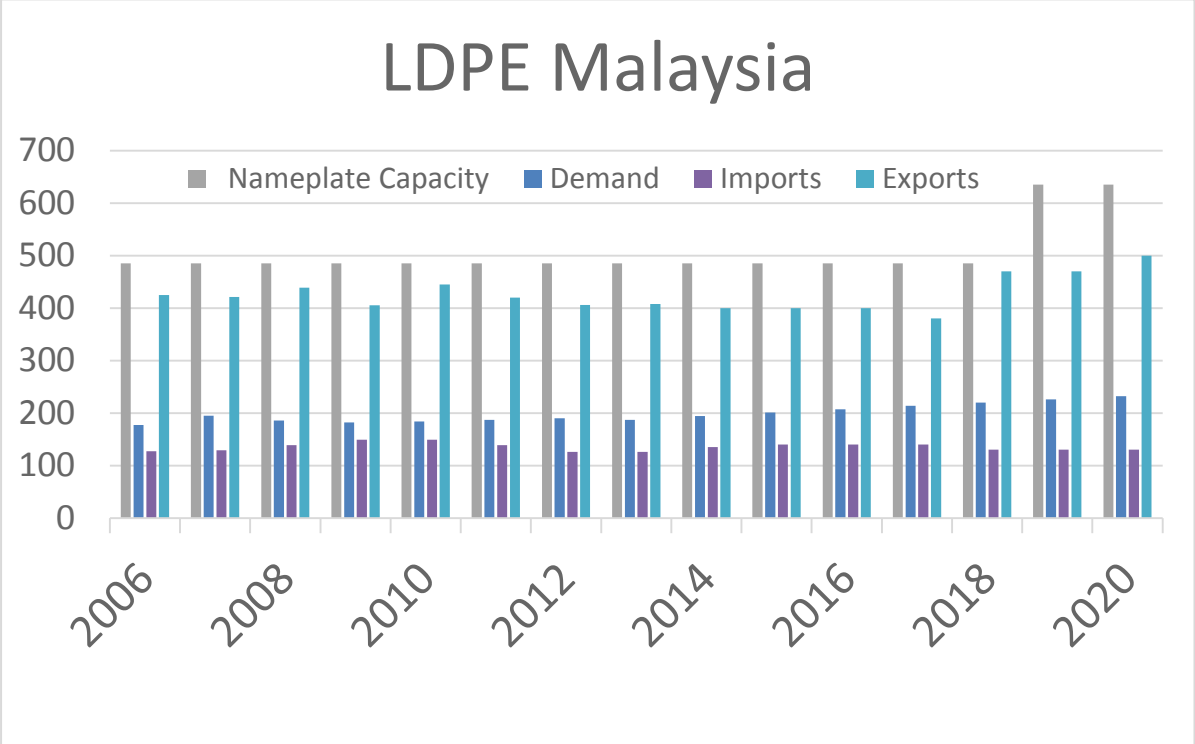
CONSUMPTION	2013	2014	2015	2016	2017	2018	2019	2020
High Density Polyethylene	501	526	553	580	605	631	657	683
Linear Low Density Polyethylene	376	401	426	451	476	502	524	545
Low Density Polyethylene	191	195	202	208	214	220	226	233
Polypropylene	407	429	451	474	495	516	537	558
Grand Total	**1475**	**1551**	**1632**	**1713**	**1790**	**1869**	**1944**	**2019**

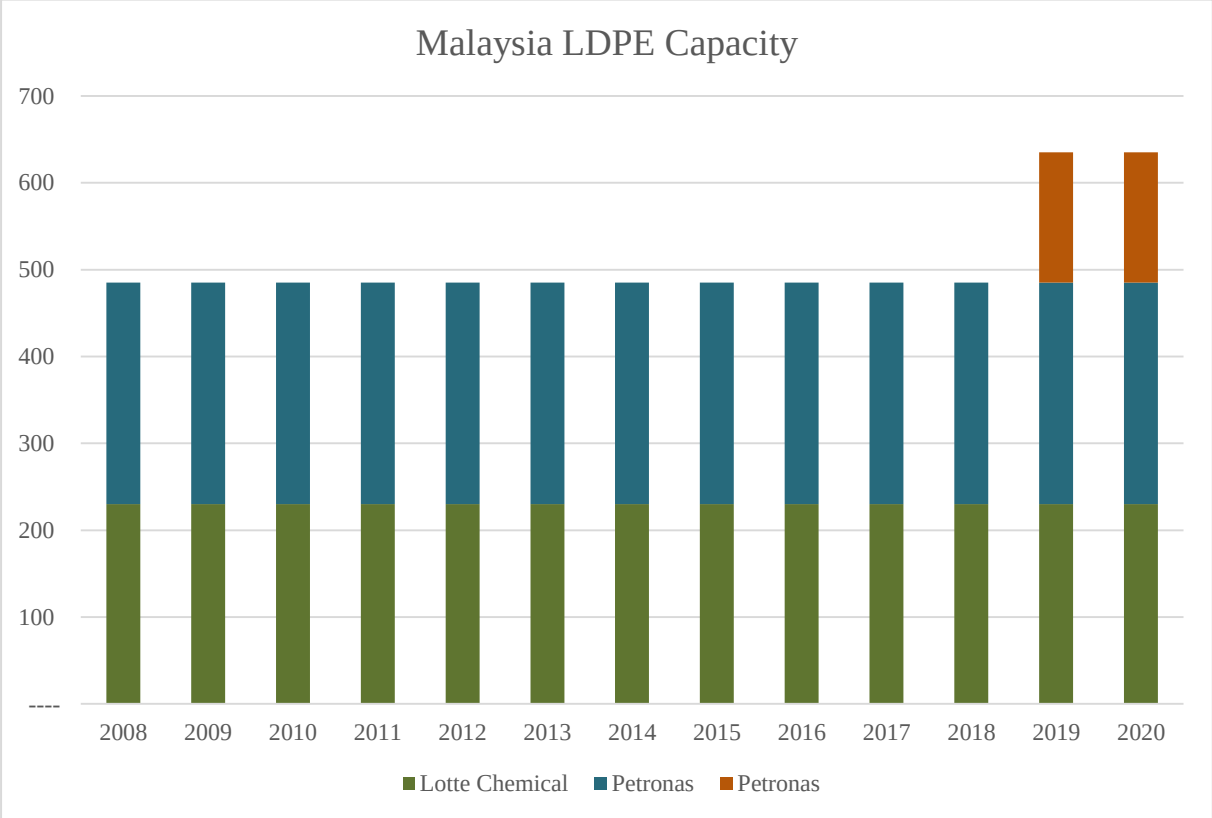
The domestic polyolefin demand in 2015 was growing at around 5.5% in line with the positive growth rate of GDP, from 1551 TO 1625 MT. In 2016, the Malaysia economy is projected to grow by 5% and the domestic polyolefin demand is expected to grow at the same pace 1625 in 2015 to 1701 mt in 2012. Main export markets are expected to continue struggling throughout 2016 which will be affecting demand for polymers. There will be no capacity expansion or addition in 2016 for polyolefin products. Due to earlier capacity shutdowns and demand growth in 2016 Malaysia remains net polyolefins importer.


Polyolefins Malaysia
3500
3000
2500
2000
1500
1000
500
0
Nameplate Capacity
Demand
Imports
Exports
2006
2008
2010
2012
2014
2016
2018
2020

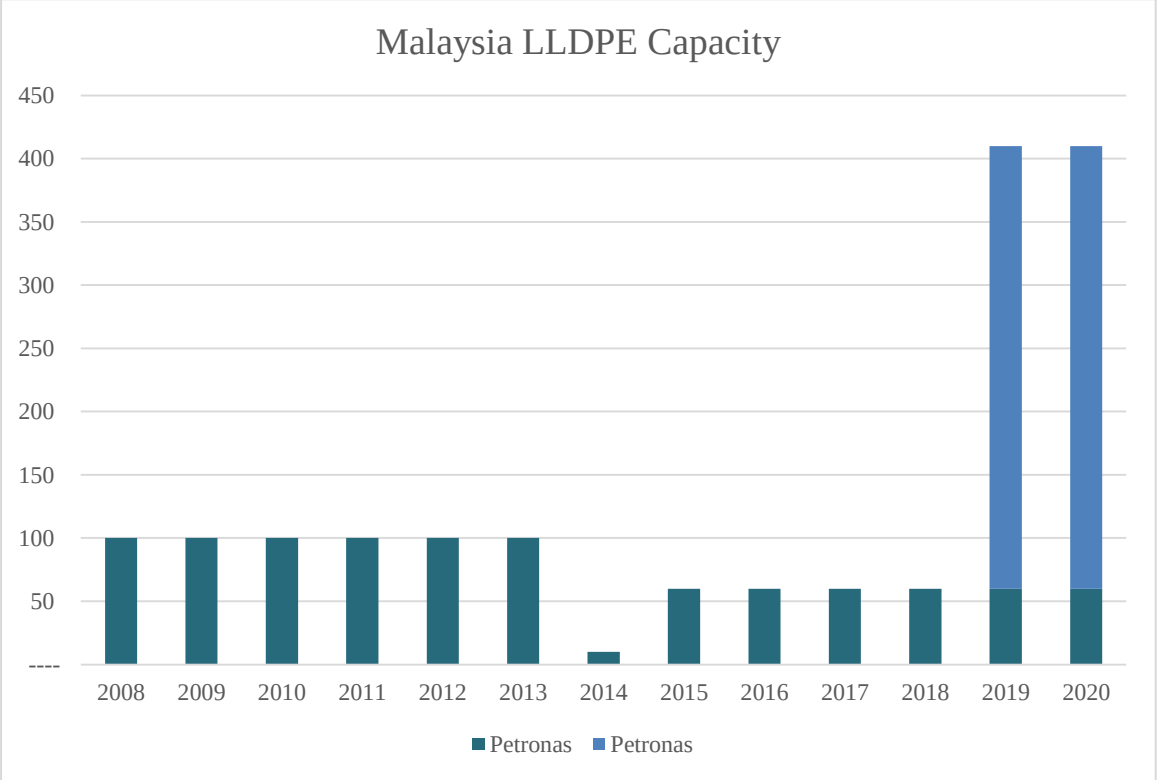
3.2.1 PE

3.2.1(a) LDPE

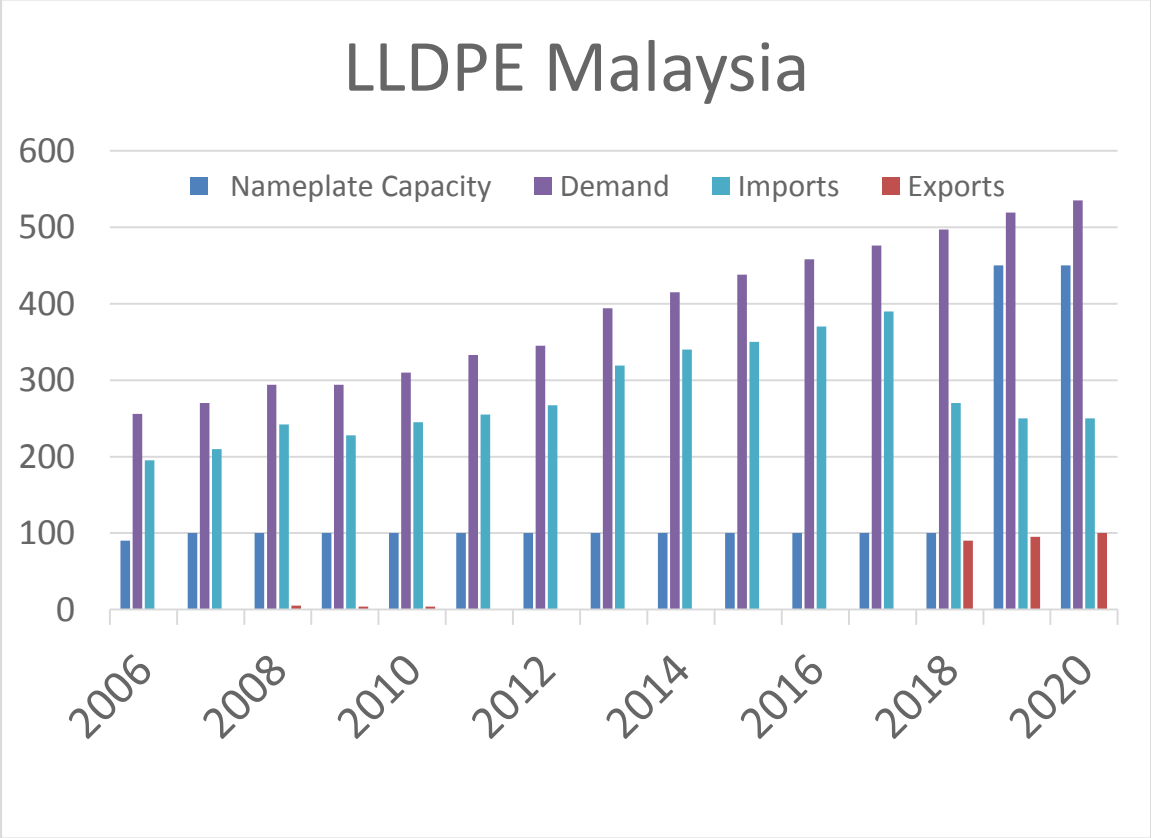




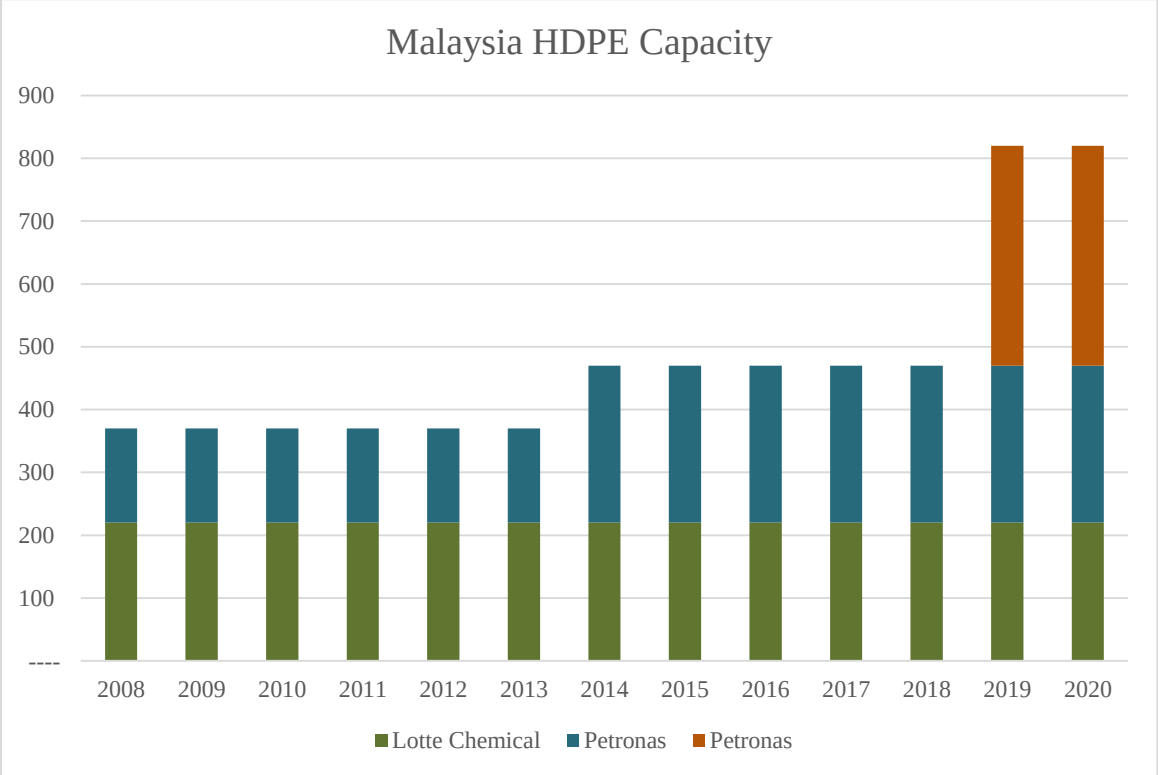
3.2.1 (b) LLDPE


Malaysia LLDPE Capacity
450
400
350
300
250
200
150
100
50

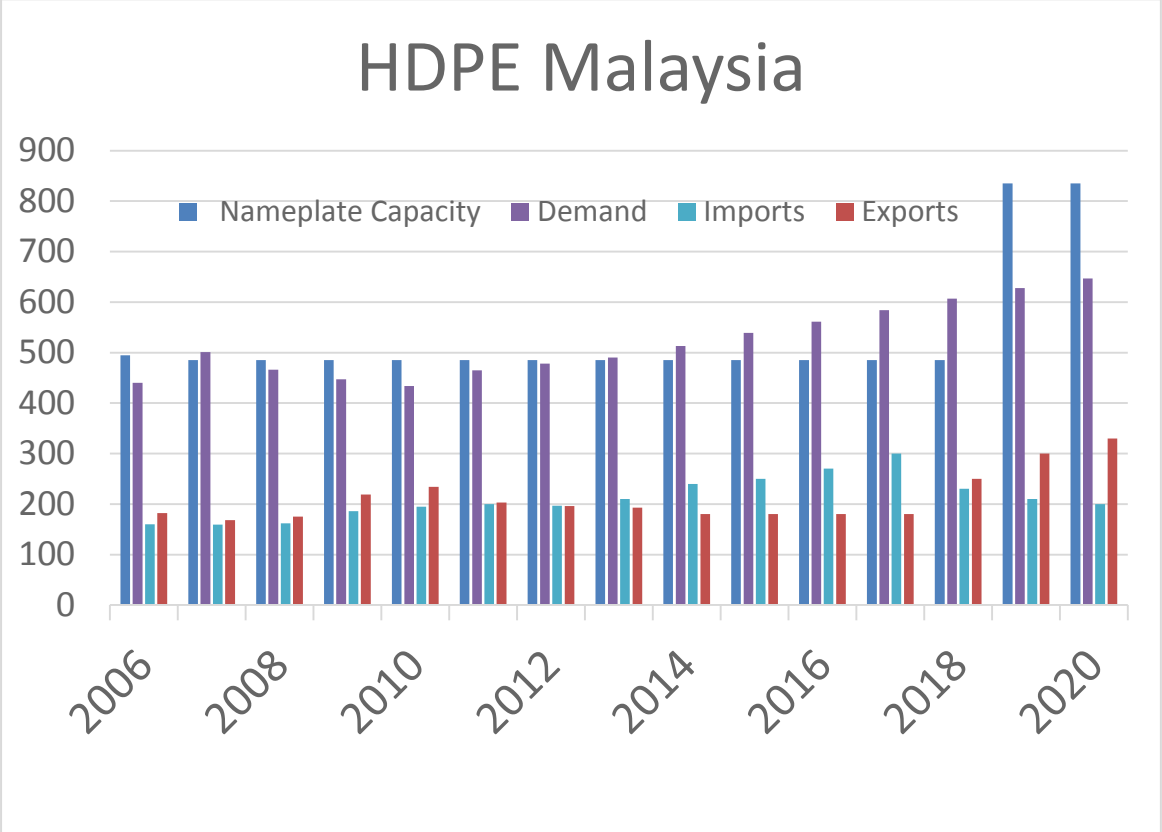
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Petronas
Petronas


LLDPE Malaysia
600
500
400
300
200
100
0
Nameplate Capacity
Demand
Imports
Exports
2006
2008
2010
2012
2014
2016
2018
2020

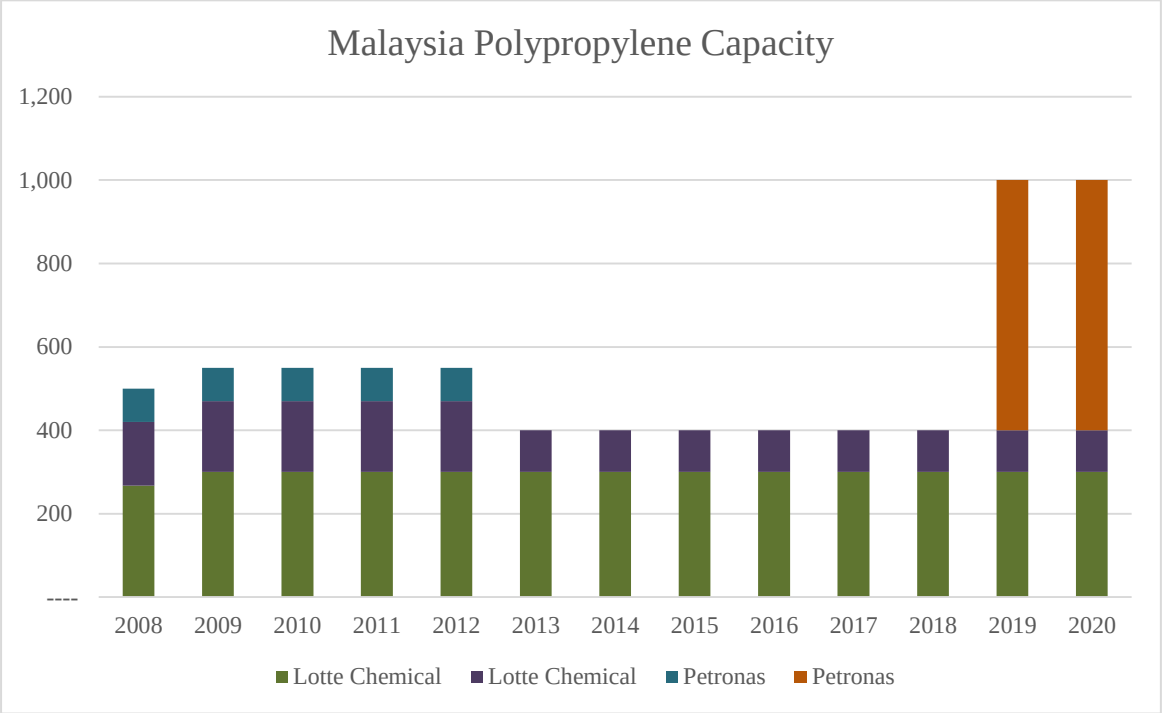
3.2.1 (c) HDPE


Malaysia HDPE Capacity
900
800
700
600
500
400
300
200
100

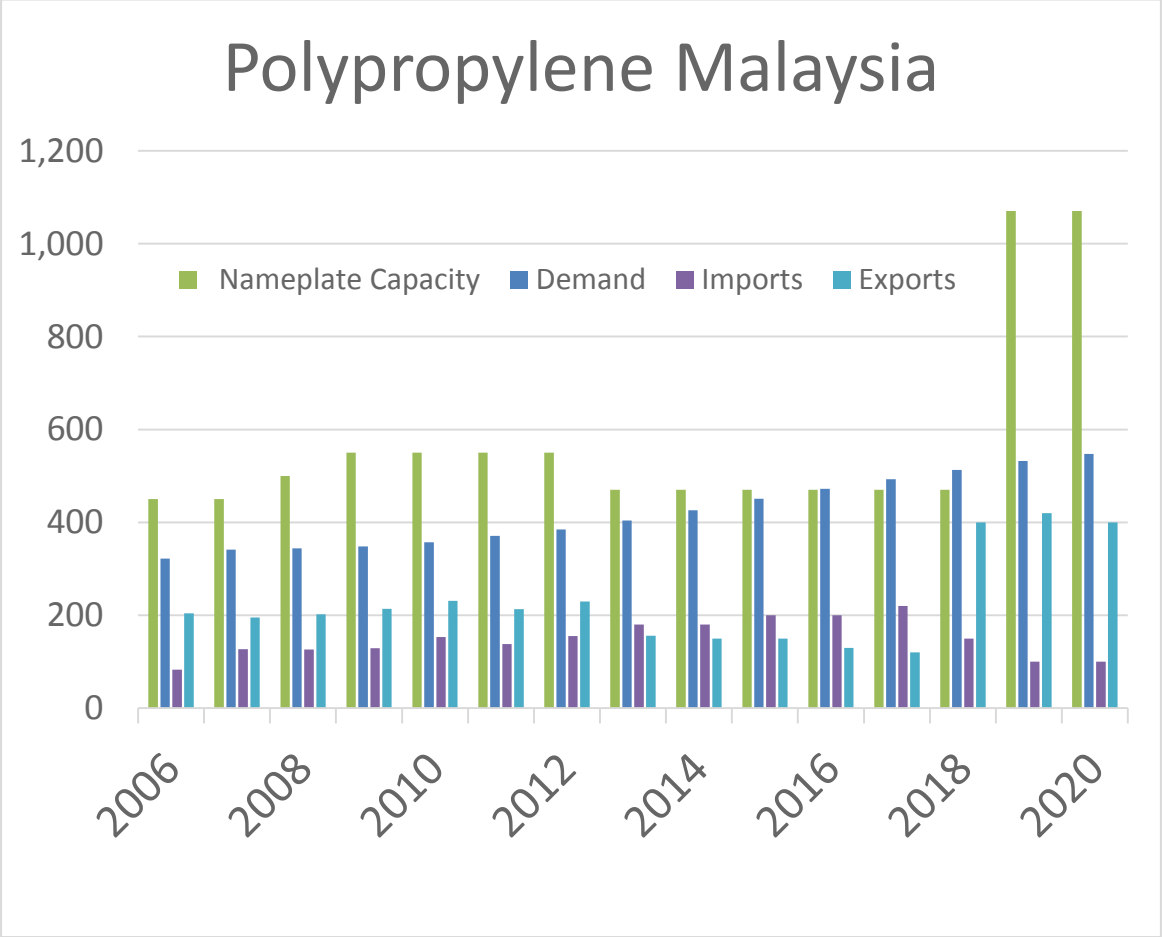
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Lotte Chemical
Petronas
Petronas


HDPE Malaysia
900
800
700
600
500
400
300
200
100
0
Nameplate Capacity
Demand
Imports
Exports
2006
2008
2010
2012
2014
2016
2018
2020

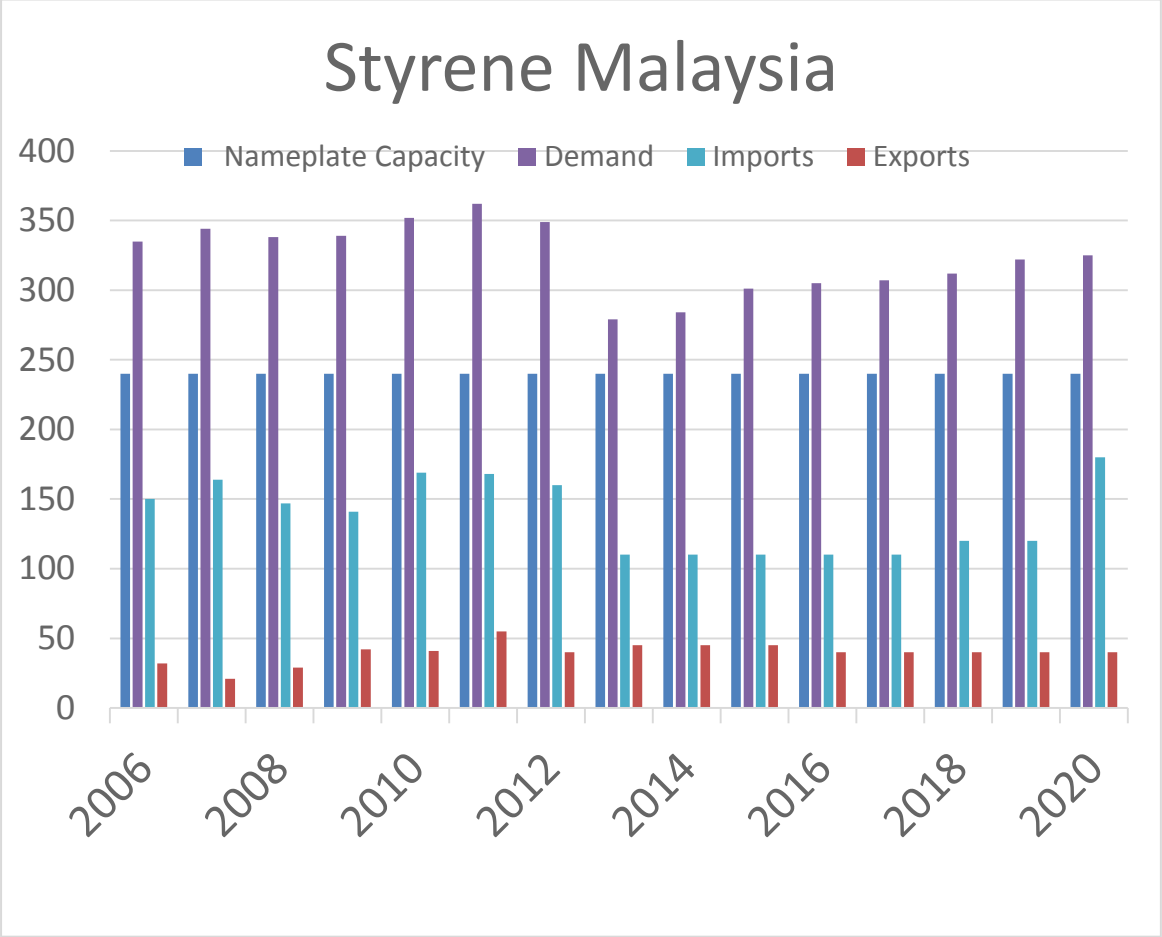
3.2.2 PP

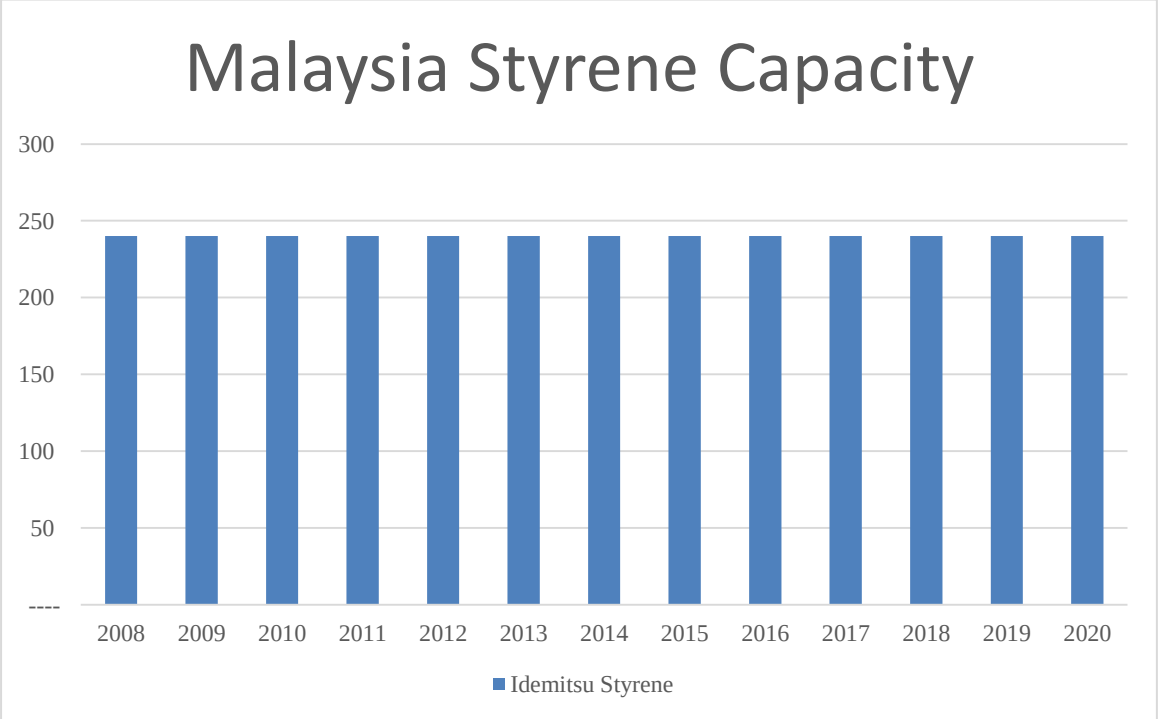

Malaysia Polypropylene Capacity
1,200
1,000
800
600
400
200

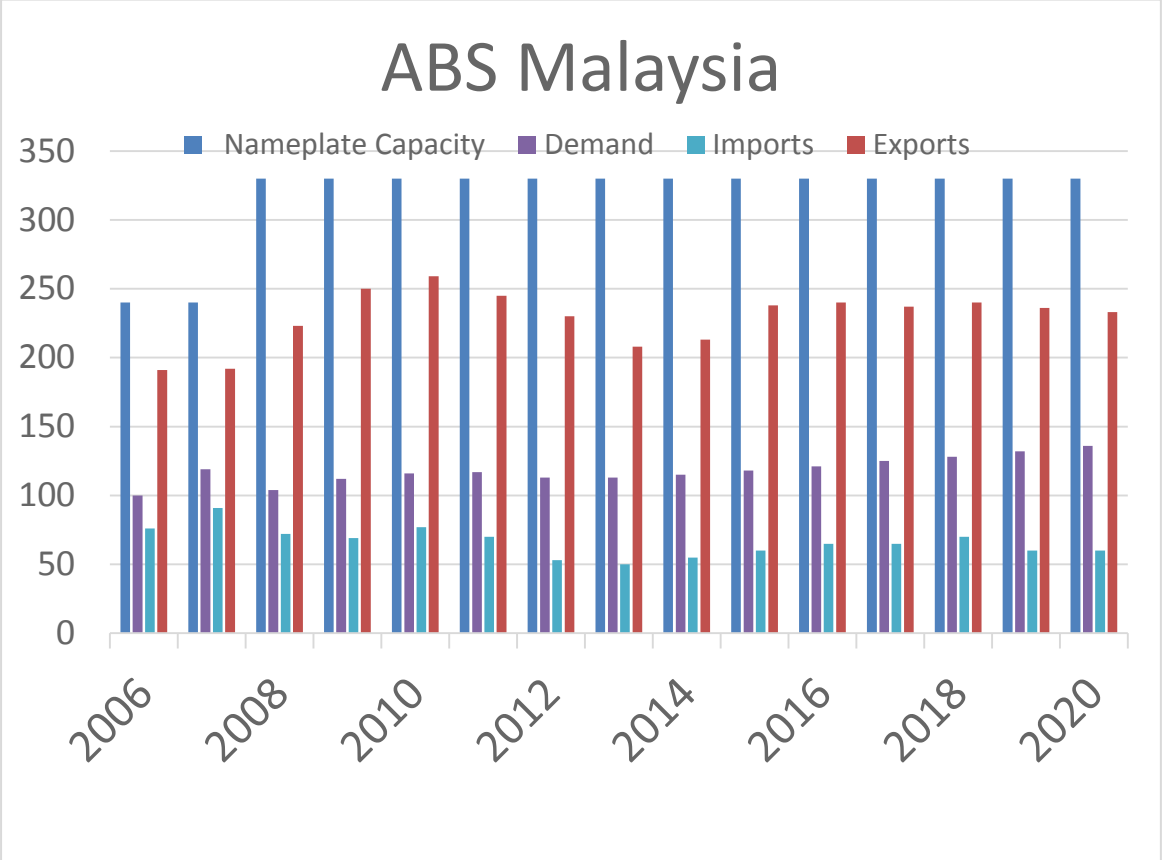
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Lotte Chemical
Lotte Chemical
Petronas
Petronas

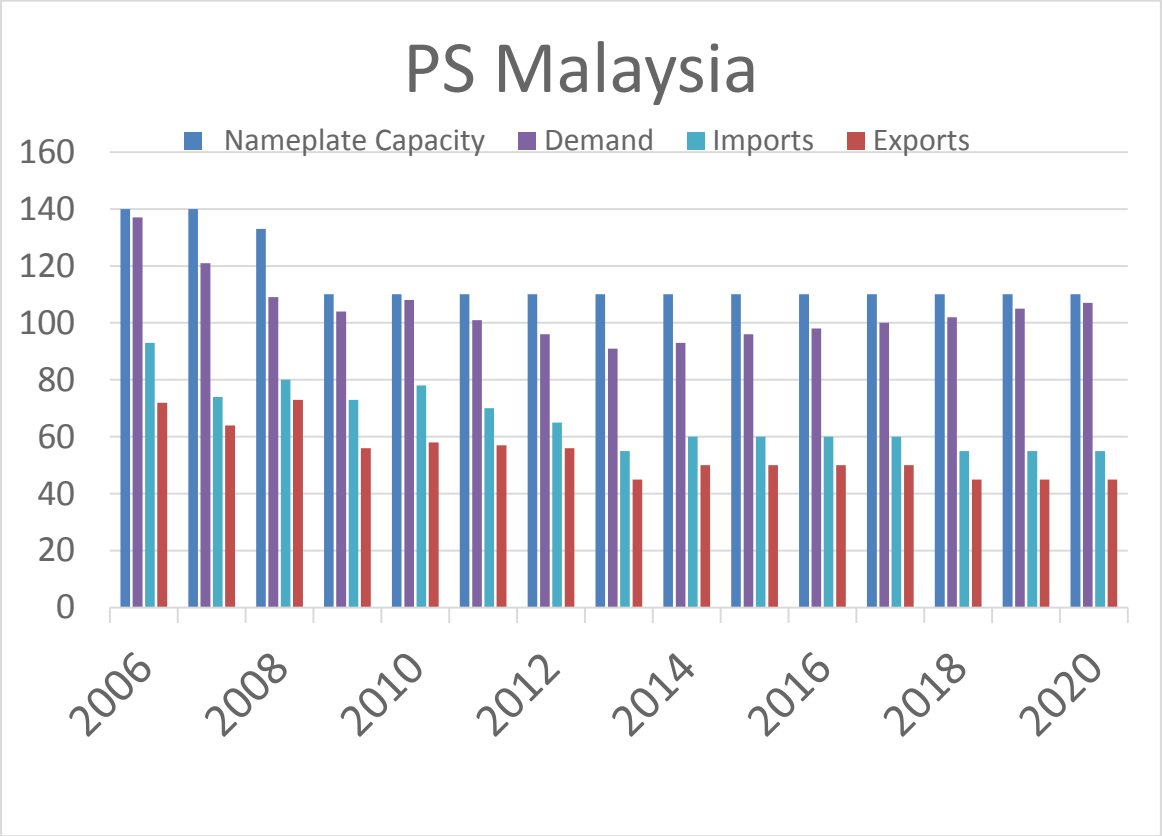

Polypropylene Malaysia
1,200
1,000
800
600
400
200
0
Nameplate Capacity
Demand
Imports
Exports
2006
2008
2010
2012
2014
2016
2018
2020

3.3. STYRENICS COMMITTEE

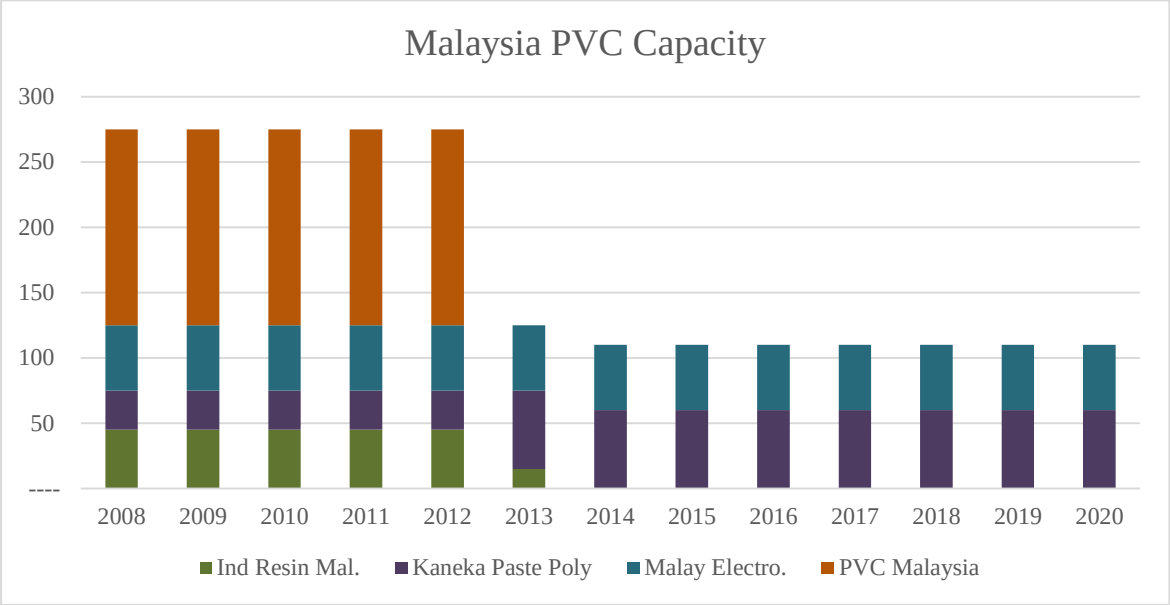


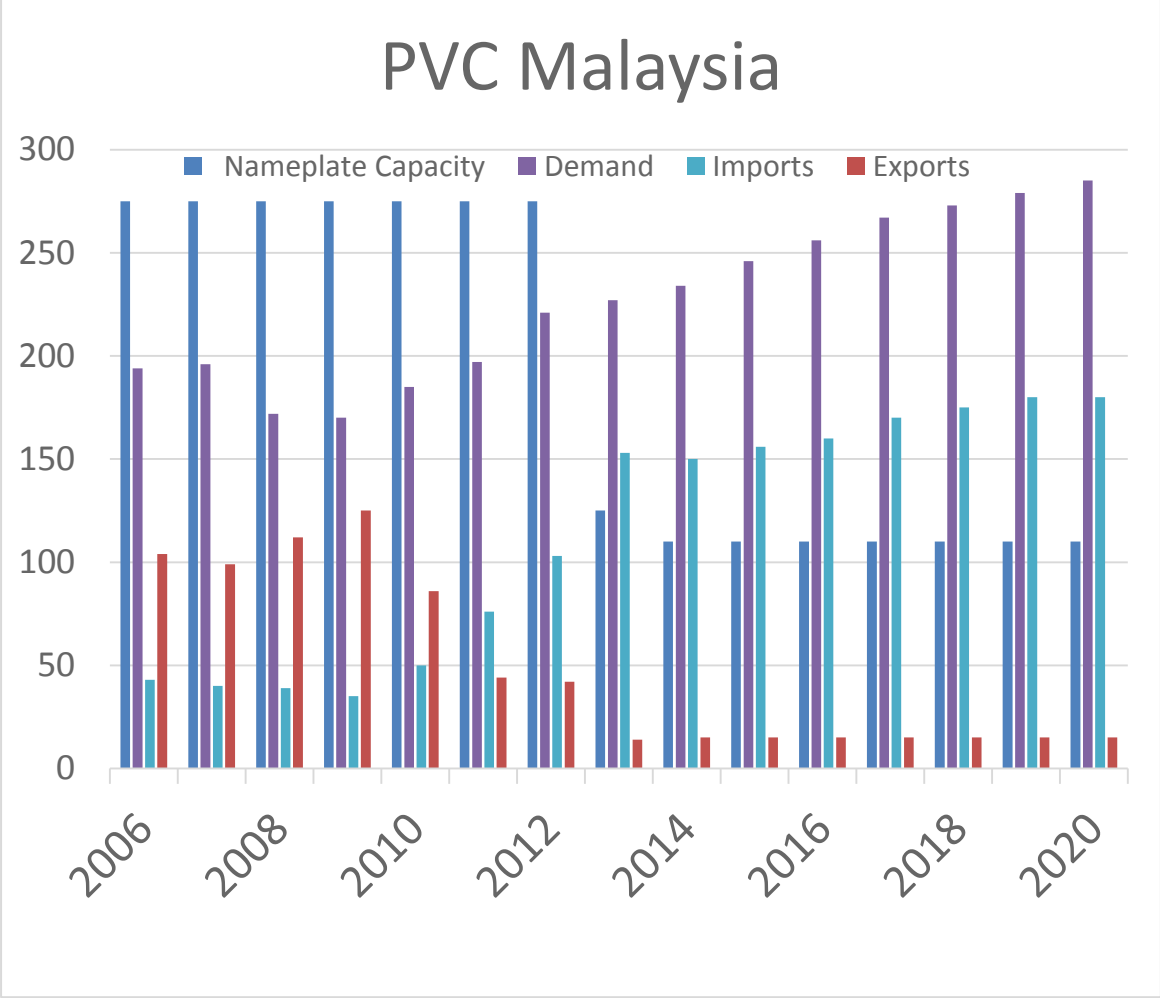



ABS Malaysia
Nameplate Capacity
Demand
Imports
Exports
350
300
250
200
150
100
50
0
2006
2008
2010
2012
2014
2016
2018
2020


PS Malaysia
Nameplate Capacity
Demand
Imports
Exports
160
140
120
100
80
60
40
20
0
2006
2008
2010
2012
2014
2016
2018
2020

3.4. PVC COMMITTEE





The landscape for PVC market in Malaysia and to some extent in South East Asia had dramatically changed with Petronas exit from VCM & PVC business at the end of 2012.
The vinyl business in PCG comprosed of three plants located in the Kertih Integrated Petrochemical Complex, Malaysia and in Vung Tau, Vietnam. The vinyl chloride monomer (VCM) and polyvinyl chloride (PVC) plants in Kertih were owned by Vinyl Chloride (Malaysia) Sdn Bhd (VCMSB), a wholly owned subsidiary of PCG, while the PVC plant in Vietnam is owned by Phu My Plastics and Chemical Company Limited (PMPC), a subsidiary of PCG. As a consequence to the discontinuation, VCMSB has ceased operations from 1 January 2013 and its plants will then be decommissioned.
Meanwhile, Malaysia's Petronas sold its 78% stake in Vietnam's Phu My Plastics to Japan's Asahi Glass, with the transaction expected to be finalized in the second quarter of 2014. Phu My Plastics has a PVC capacity of 100,000 tons/year.

As a result, domestic converters who already started importing more PVC from SEA and NEA producers in 2011 and 2012 due to overall lower operating rates of Malaysian producers have NOW find new suppliers. Remaining domestic producers will face more competition in the local market.

FUTURE PROSPECTS

Demand in 2016 is expected to remain similar to 2015 although the industry will face severe competitive pressure:

3.5. SYNTHETIC RUBBER COMMITTEE

3.5 World Rubber Production

Industry Profile

The world total rubber consumption is estimated to have increased by 0.7% in 2015, growing significantly below the 3.1% growth in 2014. World total rubber consumption is forecast to increase at an accelerating rate of 3.6% in 2016 and further at 3.5% in 2017 under the IMF Scenario. Over 2016-2024, the world total rubber consumption will increase by an average 3.1% per annum. Under the Downside Scenario, world total rubber consumption is forecast to grow by 2.8% to 27.3 million tonnes in 2016, before increasing by 3.4% in 2017 to 28.2 million tonnes.

World NR demand is forecast to increase by 2.0% to 12.6 million tonnes in 2016 under the IMF Scenario, and by 3.4% in 2017. The world total NR consumption will increase by an average 3.5% during 2016-2024. Under the Downside Scenario, the world NR demand is forecast to grow by 1.3% to 12.5 million tonnes in 2016, increasing to 16.0 million tonnes in 2024.

World SR demand is expected to increase to 14.9 million tonnes in 2016 and rise to 15.5 million tonnes in 2017 under the IMF Scenario. In 2024, the demand for SR will be 18.7 million tonnes. Demand for SR will increase by 4.1% to 14.8 million tonnes in 2016, under the Downside Scenario, subsequently increasing to 15.3 million tonnes in 2017. The outlook for NR supply is sufficient to meet the demand of the industry for all forecast years under all three scenarios. In the short-term (2016-2017), the annual surplus is expected to be the largest under the Alternate Supply scenario.

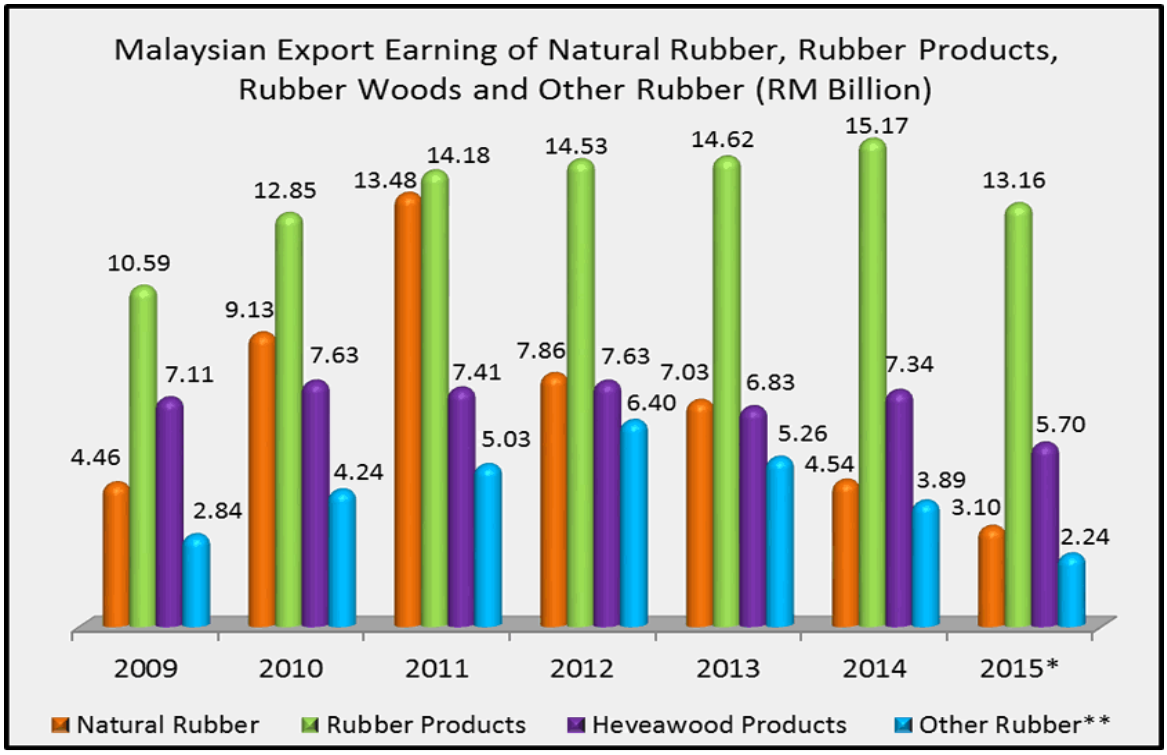
STATISTICAL SUMMARY OF WORLD RUBBER SITUATION

('000 tonnes)

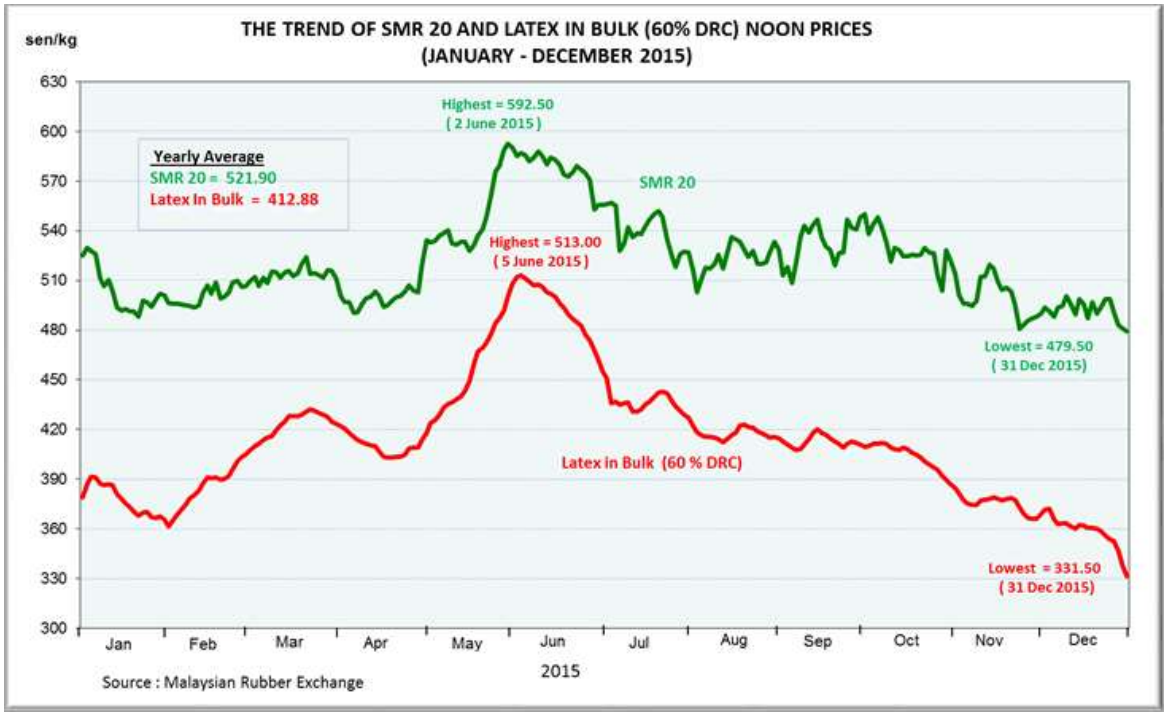
	2013	2014					2015		
	Year	Q1	Q2	Q3	Q4	Year	Q1	Q2	Q3
NATURAL RUBBER PRODUCTION									
Asia-Pacific	11416	2726	2399	2923	3168	11236	2611	2411	3128
EMEA	539	137	130	139	144	560	141	139	152
Americas	326	91	98	69	77	335	90	98	68
TOTAL	12281	2904	2626	3152	3389	12131	2842	2637	3348
NATURAL RUBBER CONSUMPTION									
Asia-Pacific	8271	2073	2264	2286	2245	8869	2121	2335	2352
EMEA	1485	396	399	393	366	1553	392	399	431
Americas	1674	437	451	421	403	1712	428	466	426
TOTAL	11430	2906	3114	3100	3014	12134	2941	3200	3209
WORLD NR SUPPLY-DEMAND SURPLUS/DEFICIT	851	58	-488	52	375	-23	-99	-563	139
WORLD NR STOCKS (1)	3263	3321	2833	2865	3240	3240	3141	2579	2718
SYNTHETIC RUBBER PRODUCTION									
Asia-Pacific	7130	1899	1860	1817	1775	7351	1801	1830	1844
EMEA	4119	1043	918	954	952	3867	1005	1056	943
Americas	2949	739	728	781	762	2970	750	783	780
TOTAL	14199	3651	3526	3512	3488	14179	3555	3669	3545
SYNTHETIC RUBBER CONSUMPTION									
Asia-Pacific	7711	2006	1924	1948	1924	7805	1895	1978	1944
EMEA	3648	931	905	865	836	3537	900	941	879
Americas	2805	711	739	745	715	2910	734	775	765
TOTAL	14164	3647	3568	3558	3496	14270	3535	3697	3588
WORLD SR SUPPLY-DEMAND SURPLUS/DEFICIT	35	4	-42	-46	-7	-91	21	-27	-43
WORLD SR STOCKS (1)	3623	3627	3586	3540	3532	3532	3553	3526	3483
% SR IN TOTAL RUBBER CONSUMPTION	55.3	55.7	53.4	53.4	53.7	54.0	54.6	53.6	52.8

Source: International Rubber Study group

Production, Consumption and Trade Performance



Note:
* January-September
** Other Rubber: Synthetic Rubber, Reclaimed Rubber, Waste Rubber, Compound Rubber and Unvulcanised Rubber (HS Code 4002-4006)

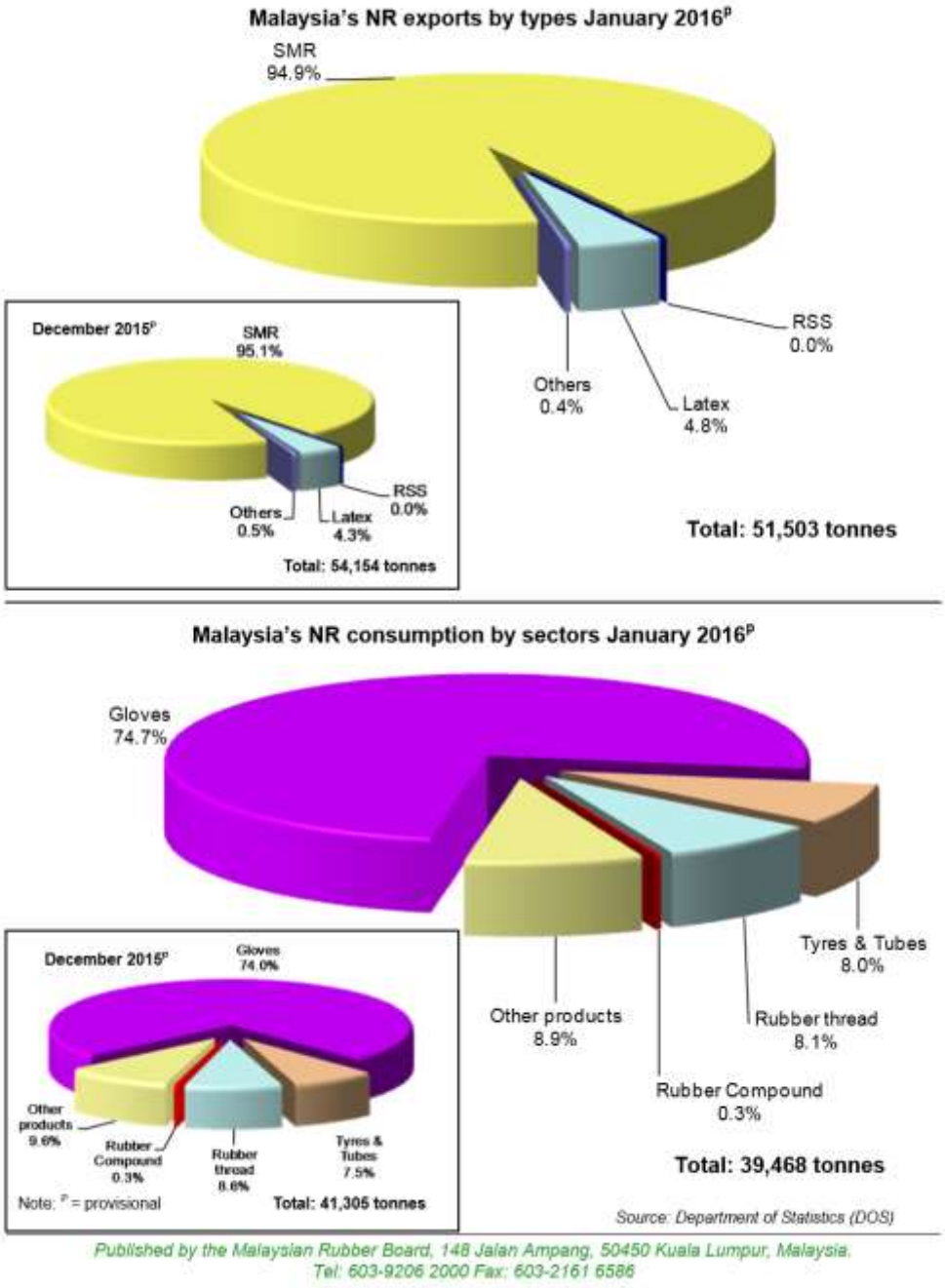


Malaysia is currently the world's sixth largest producer of NR after Thailand, Indonesia, Vietnam, China and India. Malaysia is still a net exporter of NR. Consumers can look towards Malaysia as a source of supply for quality raw rubber of SMR (Standard Malaysian Rubber) grades, specialty rubber such as ENR, DPNR and TPENR and latex concentrate products including Low Protein Latex.

Malaysia is the world eighth largest consumer of rubber and the seventh largest consumer of natural rubber (NR). The other countries in the top ten ranking include China, the USA, Japan, India, Thailand, Brazil, Indonesia, Germany and Republic of Korea. In terms of consumption of NR, Malaysia is behind China, India, the USA, Japan, Thailand and Indonesia. Other major consumers of NR include Brazil, the Republic of Korea and Germany.

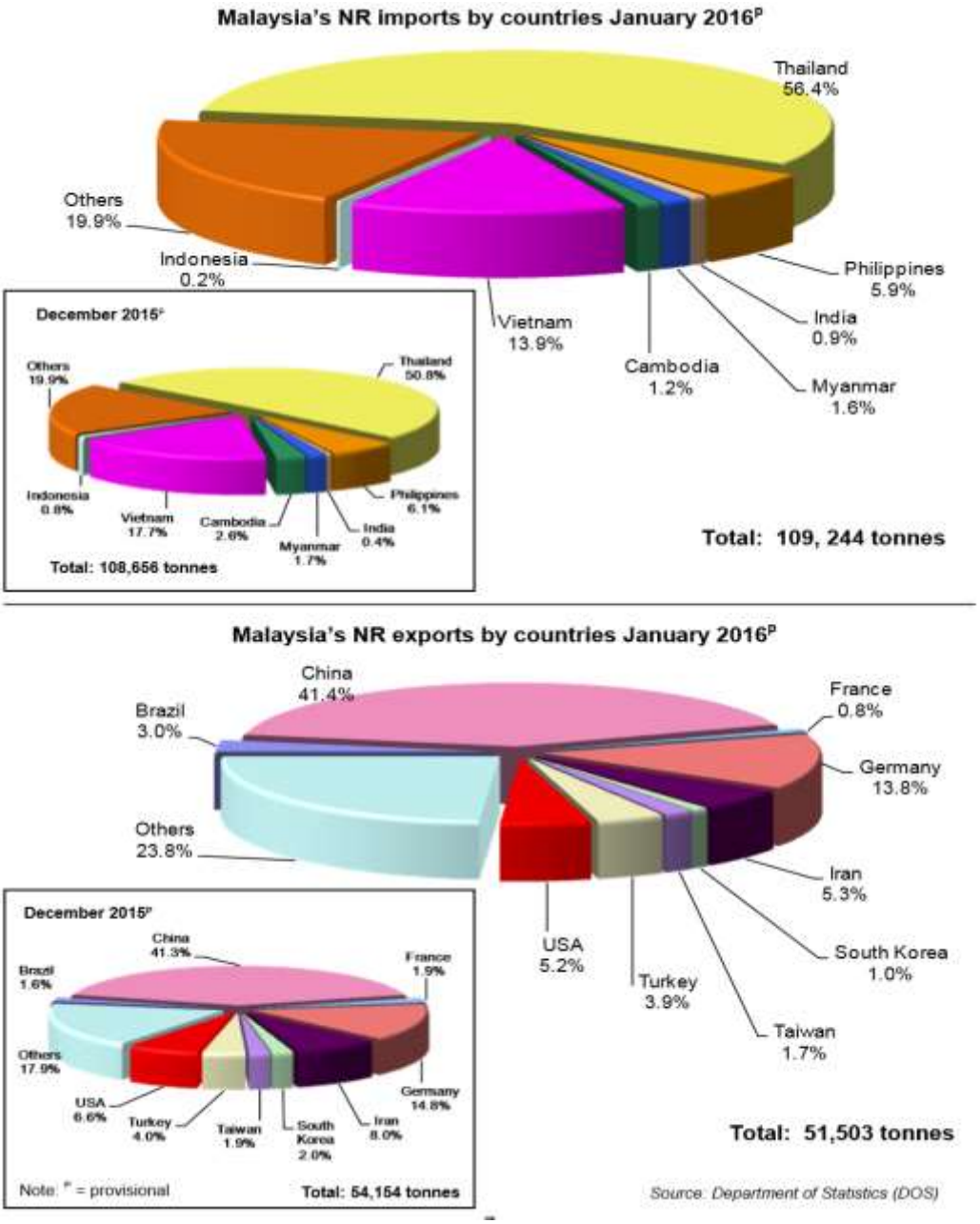
With the availability of quality raw materials, political stability and good infrastructure and research and development support from the Malaysian Rubber Board (MRB) and the Tun Abdul Razak Reasearch Centre (TARRC), Malaysia remains a global player in rubber, supplying the world market with a wide range of rubber products.

Table 2: Malaysia's NR Exports by type



Published by the Malaysian Rubber Board, 148 Jalan Ampang, 50450 Kuala Lumpur, Malaysia.
Tel: 603-9206 2000 Fax: 603-2161 6586

Table 3: Malaysia's NR Imports by countries



Destination

Malaysian rubber products are currently exported to more than 190 countries globally. The United States (USA), Germany and Japan remained the largest markets for Malaysian rubber products, accounting for more than 41% of Malaysia's total exports of rubber products. Other important markets for Malaysian rubber products manufacturers include the United Kingdom (UK), China and Australia.

3.6. SYNTHETIC FIBER RAW MATERIALS COMMITTEE

Ethylene Glycols [Mono-Ethylene Glycol (MEG), Di-Ethylene Glycol (DEG)] as Synthetic Fiber Raw Material

The Ethylene Glycols (MEG & DEG) market in Malaysia is expected to be stable until 2016 as domestic demand growth is expected to be rather limited.

At the moment, Malaysia's leading EG producer is OPTIMAL GLYCOLS (M) SDN BHD which produces three main products which are Mono-Ethylene Glycol (MEG), Di-Ethylene Glycol (DEG) and Re-Distilled Ethylene Oxide (RDO), using world-renowned EOG METEOR Technology from Dow, the most advanced, efficient and cost competitive technology for the production of MEG, DEG and high purity EO for derivatives.

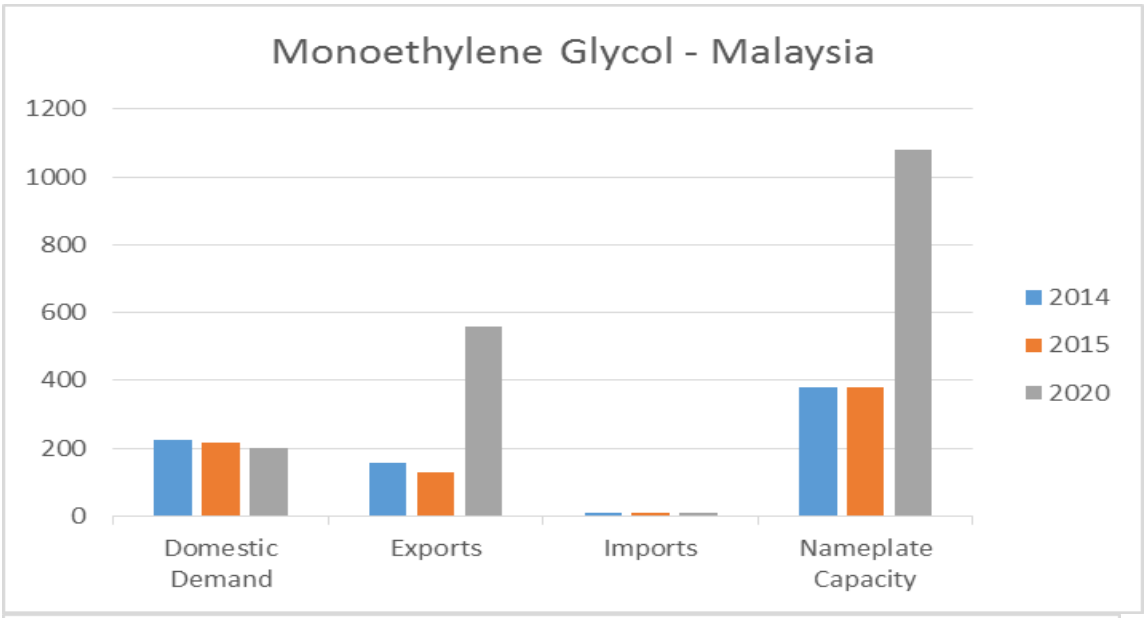
Both, MEG (the largest volume product manufactured by OPTIMAL GLYCOLS) and DEG are sold within Malaysia and to various countries throughout the Asia Pacific region. OPTIMAL's production capacity of MEG is 365kTa and is applied in resins for fibers and PET containers or bottles, antifreeze as well as electronic applications. OPTIMAL's production capacity for DEG is 20kTa and used in the production of unsaturated polyester resins (used for fiberglass) and brake fluid formulation.

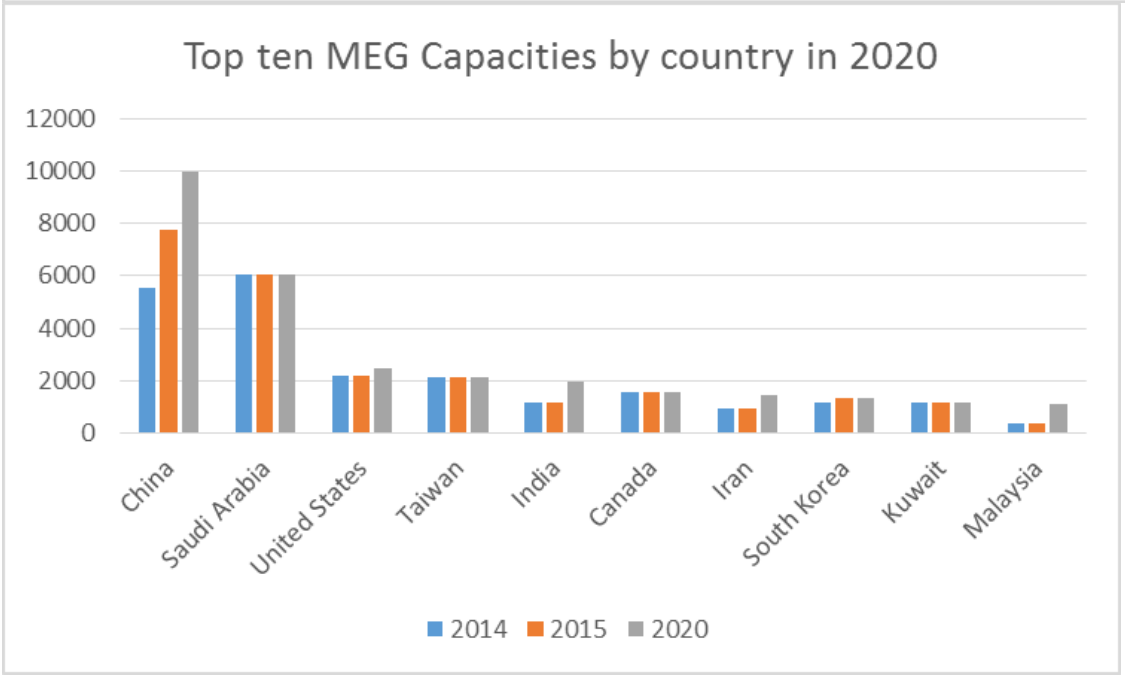
The OPTIMAL Group of Companies tap on Dow's established channels and distribution network within the Asia Pacific region. The company's key markets include South East Asia, Japan, South Korea, China and Taiwan. About 60 percent of OPTIMAL's products are utilized to meet local demands with the remaining 40 percent for the export market.

The EG market growth relies heavily on the polyester demand or supply since it is a key feedstock together with Purified Terephthalic Acid (PTA) in this industry. The Asia market however, is projected to have immense potential on the EG growth and consumption.

During the recession in 2008-2009 monoethylene glycol (MEG) market slowed down global but production has already markedly increased in 2010. Today major MEG producers include Saudi Arabia, China, Taiwan, USA and Canada. In near future global demand growth rate is expected to be about 6% per year, while China is forecasted to grow at 6.5%. Today China is the largest MEG consumer, but the country still depends on import. New capacity introductions are expected to partially solve this problem.

In terms of new MEG capacities in Malaysia, Petronas Chemicals Group (PCG) has recently announced their new refinery and petrochemical project, RAPID (Refinery and Petrochemicals Integrated Development) located in Pengerang, Johor, Malaysia and the project is due for completion by 2019. MEG is most likely one of the potential products which may be produced by RAPID.


Monoethylene Glycol - Malaysia
1200
1000
800
600
400
200
0
Domestic Demand
Exports
Imports
Nameplate Capacity
2014
2015
2020


Top ten MEG Capacities by country in 2020
12000
10000
8000
6000
4000
2000
0
China
Saudi Arabia
United States
Taiwan
India
Canada
Iran
South Korea
Kuwait
Malaysia
2014
2015
2020

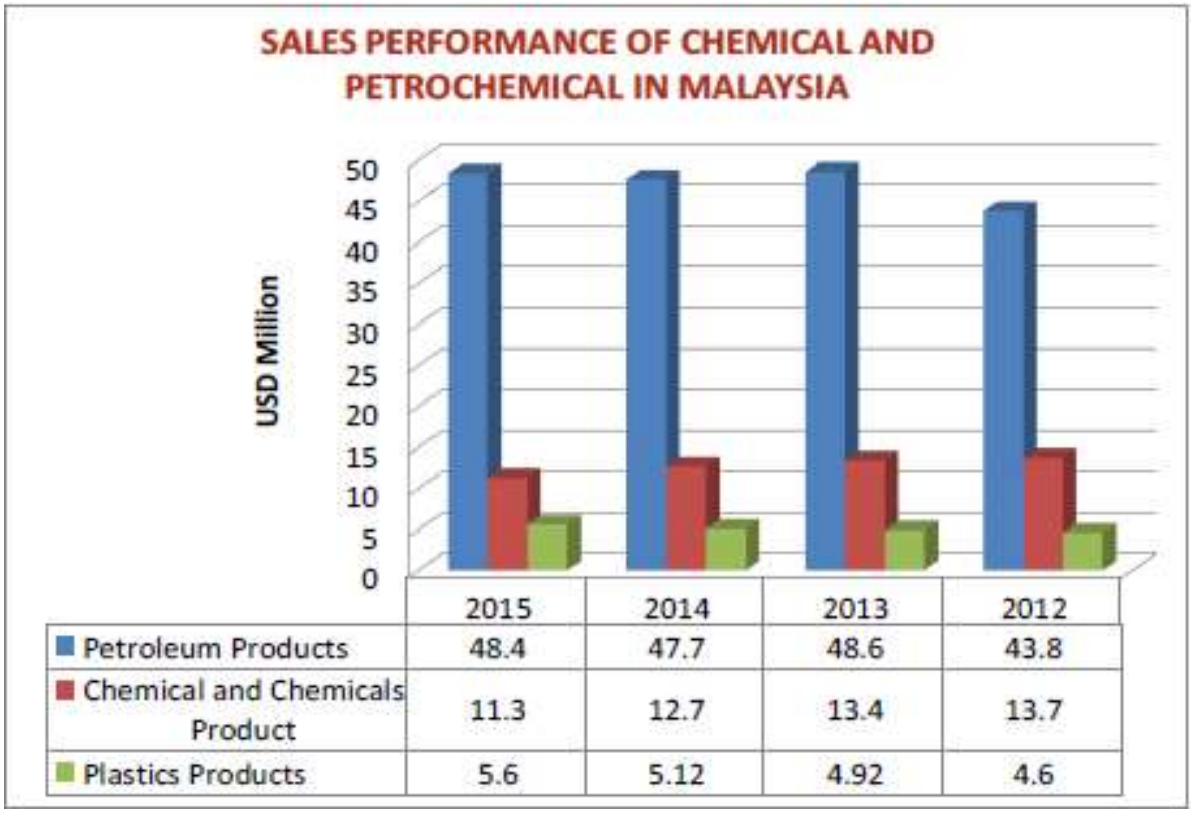
3.7. CHEMICALS COMMITTEE

Industry Profile: Chemicals & Chemical Products

Chemicals & chemical products is one of the leading industries in Malaysia, maintaining its second position as the largest contributor to Malaysia's total exports of manufactured goods. The chemical industry players range from MNCs, big local companies and SMEs. About 90% of the companies are SMEs. Availability of feedstock and resources such as palm oil and hydrocarbon from oil and gas have promoted development of downstream industries i.e. oleochemicals and petrochemicals.

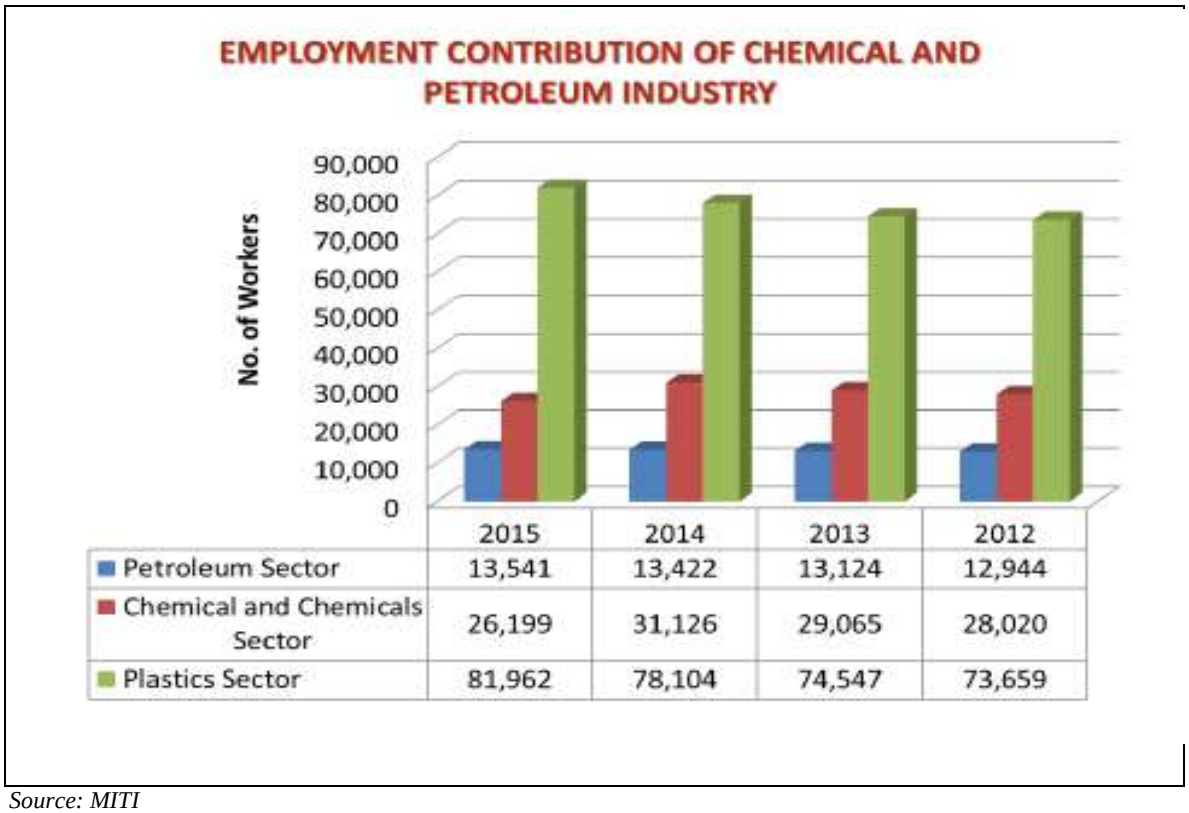
Malaysia's diverse chemical industry includes one of the largest oleochemical sectors in in the world, accounting for 20% of global capacity, and a petrochemical industry that is world-renowned and an integral part of the wider chemicals industry providing a steady supply of feedstock material to the sector. Until now, the three world-scale petrochemical zones in Gebeng, Kertih and Pasir Gudang have been the country's petrochemical manufacturing hubs. However, the refinery and petrochemical integrated development (RAPID) project in Pengerang is poised to change the face of Malaysia's and South East Asia's chemical industry.

Trade liberalisation under the Free Trade Agreements (FTAs) and ASEAN Free Trade Agreements (AFTA) is expected to open up vast opportunities for the Malaysian chemical industry. However, due to the competitive nature of the industry, the future growth of the Malaysian chemical industry will depend on the ability of domestic manufacturers to sustain their competitiveness through improvements in technologies and skills to maintain current markets and diversify into new markets.



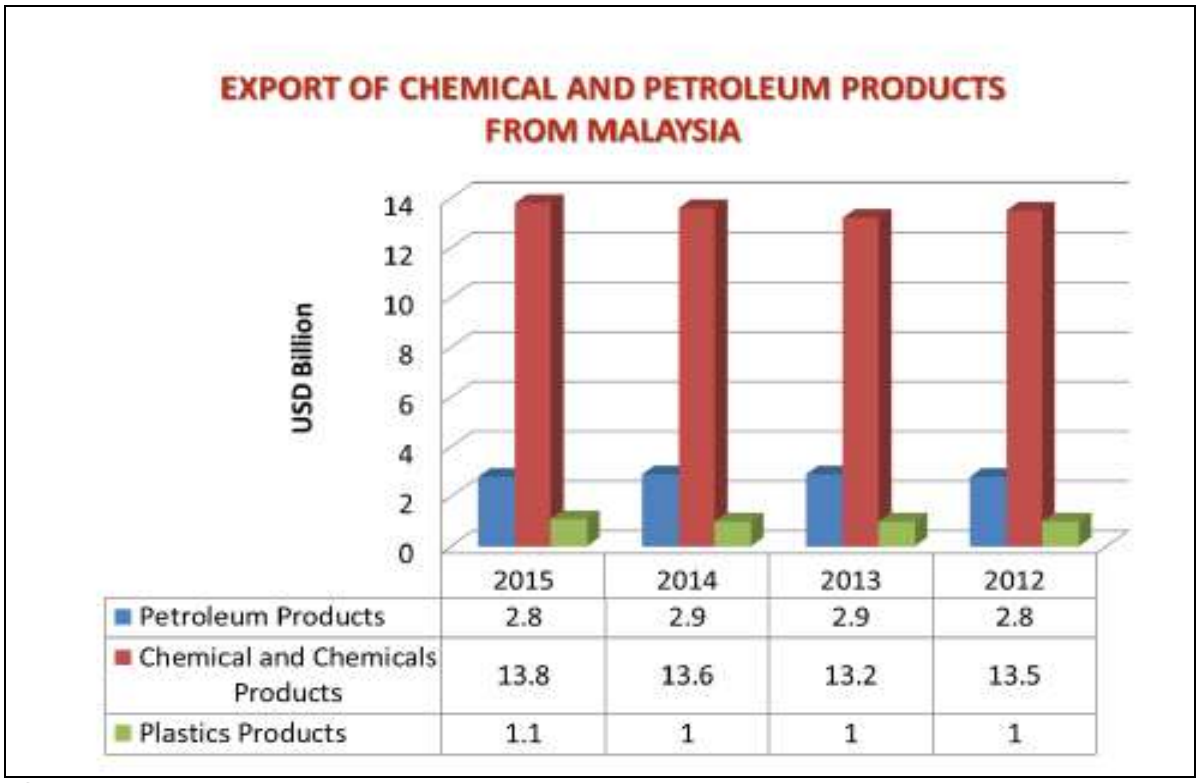
	2015	2014	2013	2012
Petroleum Products	48.4	47.7	48.6	43.8
Chemical and Chemicals Product	11.3	12.7	13.4	13.7
Plastics Products	5.6	5.12	4.92	4.6

Source: MITI



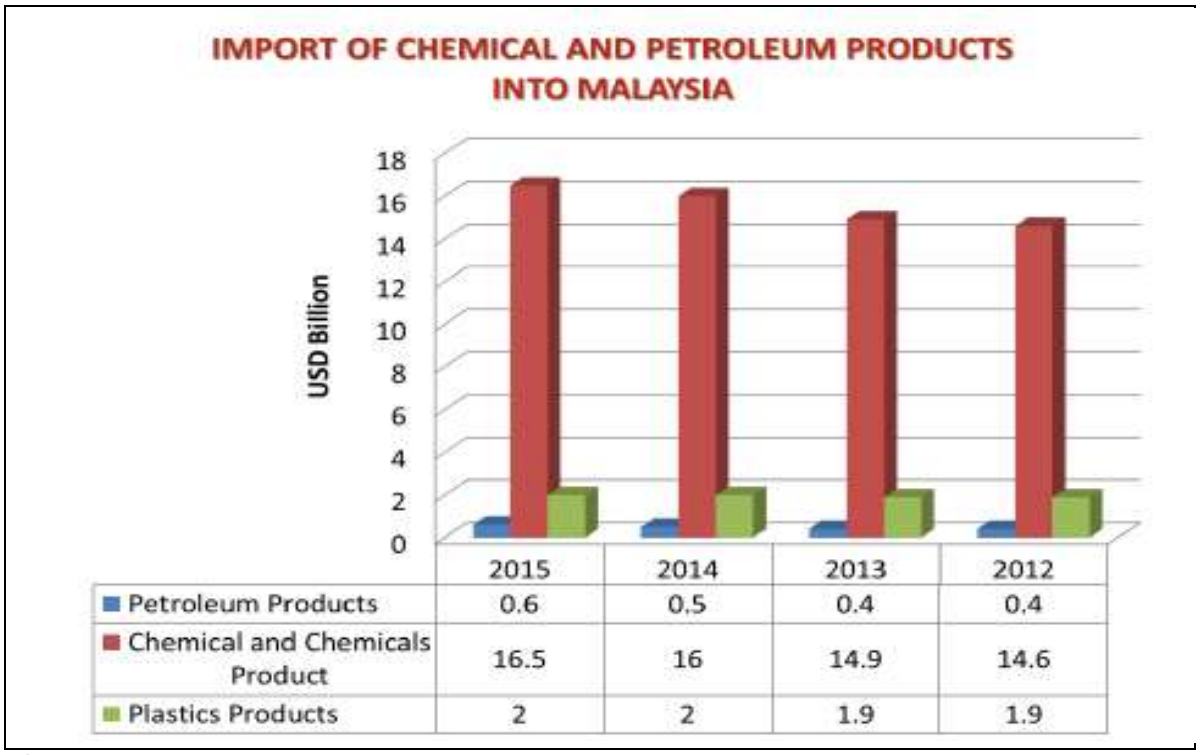
	2015	2014	2013	2012
Petroleum Sector	13,541	13,422	13,124	12,944
Chemical and Chemicals Sector	26,199	31,126	29,065	28,020
Plastics Sector	81,962	78,104	74,547	73,659

Source: MITI



	2015	2014	2013	2012
Petroleum Products	2.8	2.9	2.9	2.8
Chemical and Chemicals Products	13.8	13.6	13.2	13.5
Plastics Products	1.1	1	1	1

Source: MITI



	2015	2014	2013	2012
Petroleum Products	0.6	0.5	0.4	0.4
Chemical and Chemicals Product	16.5	16	14.9	14.6
Plastics Products	2	2	1.9	1.9

Source: MITI

Oleochemicals Industry

Malaysia continues to be one of the leading producers and exporters of basic oleochemicals in the world. The oleochemical capacities for the year 2015 are as follows:

	2013	**2014**	**2015**
'000 tonnes			
Fatty Acids	1 646	1 867	1 843
Methyl Esters	519	572	560
Fatty Alcohol	445	448	518
Refined Glycerine	277	287	316

Source: AOMG

The total export of oleochemical products for year 2015 increased by 0.8% to 2.85 million tonnes due to higher demand from other export markets i.e. South Korea, Turkey, Vietnam and Japan. Meanwhile, there was a slight increase of 0.03% in export value of oleochemicals at RM 11 295 million. Oleochemical exports accounts for 18.8% of the total export revenue of palm oil products for the year.

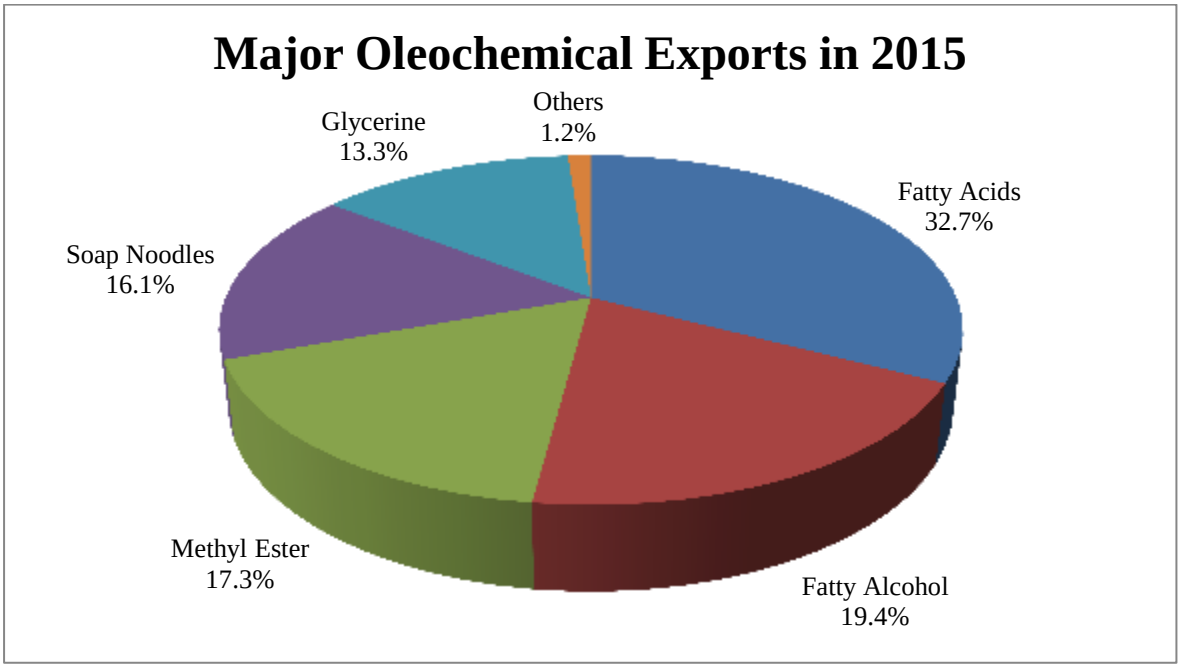
Year	**2011**	**2012**	**2013**	**2014**	**2015**
Total Exports ('000 tonnes)	2 181	2 601	2 727	2 828	2 850
Export Value (RM million)	10 846.9	11 455.6	9 297.6	11 291	11 295

Source: Malaysian Palm Oil Board

The EU remained as Malaysia's main export market for year 2015. The other major export markets for the Malaysian oleochemical industry for the same year were:

Export Markets	**2012**		**2013**		**2014**		**2015**	
	'000 tonnes	**%**	**'000 tonnes**	**%**	**'000 tonnes**	**%**	**'000 tonnes**	**%**
EU	0.66	25.4	0.63	23.1	0.64	22.6	0.56	19.8
China	0.37	14.2	0.41	15.0	0.43	15.2	0.41	14.4
US	0.23	8.8	0.26	9.5	0.26	9.2	0.25	8.9
Japan	0.22	8.5	0.21	7.7	0.22	7.8	0.23	8.2
India	0.16	6.2	0.15	5.5	0.16	5.6	0.15	5.4

Source: Malaysian Palm Oil Board



Source: Malaysian Palm Oil Board

According to the Malaysia Investment Performance Report 2015, total investments by the oleochemical industry approved for the year 2015 amounted to RM 662.7 million or about 30.1% of the total investments received for the palm oil industry. The approvals were for 7 oleochemical projects (out of which 2 are new projects) and it was estimated to generate 304 new job opportunities. Over 62% of these investments were from foreign sources (RM413.3 million), while the rest came from domestic sources (RM249.4 million). One significant project is a RM588 million biosynthetic base oil project which will utilize palm oil derivatives to produce base oils for motor oils and lubricants used in various light and heavy industries.

CHAPTER FOUR

4.0. Malaysian Petrochemicals Association (MPA)

4.1. BACKGROUND

The Malaysian Petrochemicals Association (MPA) is a formal association registered with the Registrar of Societies in Malaysia. At present, members of MPA include companies engaged in the manufacture and trading of petrochemicals and plastic resins, as well as companies providing services required by the petrochemical industry.

The MPA was officially formed on March 19, 1997 with the following objectives:-.

- To provide a forum to discuss and resolve common problems of the petrochemical industry
- To provide a focal point for the petrochemical industry to liaise with the public and government and to make recommendations on relevant issues
- To advance the philosophy of Responsible Care, its implementation and compliance throughout the industry
- To represent the petrochemical industry within Malaysia to interface with similar groups on international basis
- To compile and disseminate information of common concerns and provide facilities for consultation and exchange of views between members.

4.2. MPA MEMBERS

1. Air Liquide Global E&C Solutions Malaysia Sdn Bhd
2. Ancom Kimia Sdn Bhd
3. BASF (M) Sdn Bhd
4. BASF-PETRONAS Chemicals Sdn Bhd
5. BP PETRONAS Acetyls Sdn Bhd
6. Chiyoda Malaysia Sdn Bhd
7. Dow Chemical (Malaysia) Sdn Bhd
8. Foster Wheeler E&C (Malaysia) Sdn Bhd
9. Idemitsu Chemicals (M) Sdn Bhd
10. Kemaman Bitumen Company Sdn Bhd
11. Lotte Chemical Titan (M) Sdn Bhd
12. MHE-Demag Malaysia Sdn Bhd
13. Petrochemicals (M) Sdn Bhd
14. PETRONAS Chemicals Derivatives Sdn Bhd
15. PETRONAS Chemicals Ethylene Sdn Bhd
16. PETRONAS Chemicals Group Berhad
17. PETRONAS Chemicals LDPE Sdn Bhd
18. PETRONAS Chemicals MTBE Sdn Bhd
19. Petrotechnical Inspection (M) Sdn Bhd
20. Recron Malaysia Sdn Bhd
21. Sinar Berlian Sdn Bhd
22. Steel Hawk Engineering Sdn Bhd
23. Technip Geoproduction (M) Sdn Bhd
24. Toray Plastics (M) Sdn Bhd
25. Toyo Engineering & Construction Sdn Bhd

4.3. MPA COUNCIL 2015 / 2016

PRESIDENT
Mr Akbar Md Thayoob
PETRONAS Chemicals Group Berhad

VICE PRESIDENT
Mr Cheong Peng Khuan
Lotte Chemical Titan (M) Sdn Bhd

HONORARY SECRETARY
Mr Abdul Mazlan Abdul Razak
PETRONAS Chemicals LDPE Sdn Bhd

HONORARY TREASURER
Dr Stefan Beckmann
BASF PETRONAS Chemicals Sdn Bhd

COUNCIL MEMBERS
Mr Edmund Tan Teck Boon
BASF (M) Sdn Bhd

Mr James Thong
Dow Chemical (Malaysia) Sdn Bhd

Mr Hideto Yoshimi
Idemitsu Chemicals (M) Sdn Bhd

Mr Sanjay Gover
Kemaman Bitumen Company Sdn Bhd

Mr Lim Boon Hoe
Petrochemicals (M) Sdn Bhd

Mr Takehiko Takayama
Toray Plastics (M) Sdn Bhd

CHAIRMAN
MPA Plastic Resins Producers' Group
Mr Abdul Mazlan Abdul Razak
PETRONAS Chemicals LDPE Sdn Bhd

4.4. MPA SECRETARIAT

Malaysian Petrochemicals Association (MPA)
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