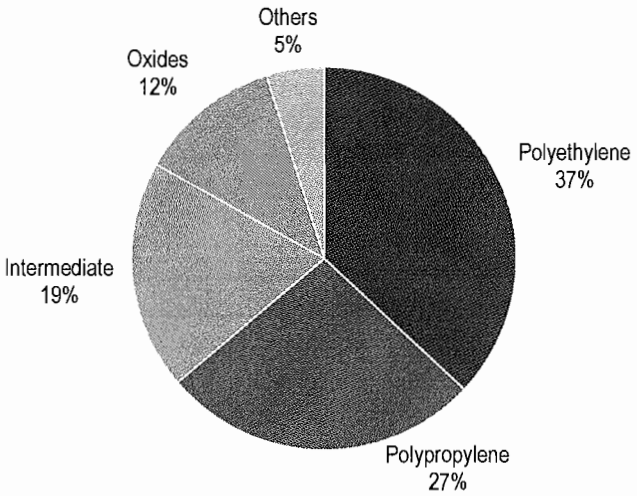
3.1 OLEFINS MARKET

3.1.1 Global and Regional Overview

Base olefins (defined as ethylene and propylene for Section 3) are regarded as the most commercially important components of the petrochemical industry and the primary building blocks for various chemical intermediates, polymers and rubbers. Nexant estimates that the combined consumption of base olefins was approximately 244 million tons in 2016. Nexant forecasts growth at a CAGR of 3.7 percent over the period 2017-2027. The main consumption drivers are tied to emerging markets through increasing consumption in plastic packaging, automotive, textiles and construction sectors.

Nexant estimates that approximately 64 percent of base olefins globally are consumed directly to make polyolefins. Chemical intermediates, such as ethylene dichloride, styrene and cumene account for approximately 19 percent of consumption and oxides (ethylene oxide/propylene oxide) approximately 12 percent. Other products include synthetic rubbers and other miscellaneous applications represent approximately 5 percent of demand.

Figure 3.1 Global Olefins Consumption by End Use
(2016)

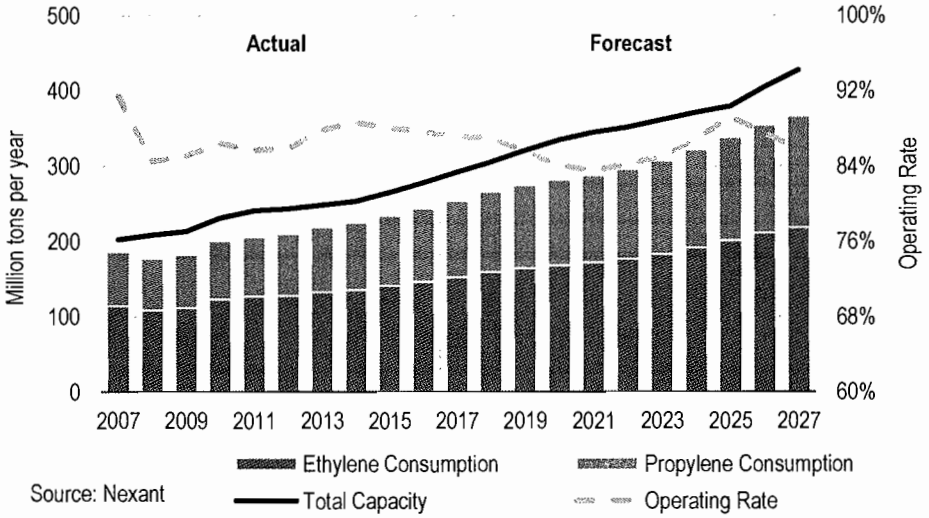


Source: Nexant **Total Global Demand = 244 million tons**

The majority of olefin market consumption is for ethylene which in 2016 accounted for nearly 60 percent of the total, at approximately 147 million tons with the remaining of 40 percent for propylene. However, Nexant forecasts both ethylene and propylene to exhibit similar demand growth of over 3-4 percent CAGR over the period 2017-2027.

The bulk of olefins produced tend to be for captive consumption whereby production is typically consumed on site by adjacent derivative plants. The business model is driven by the high cost of transportation associated with olefins, which exist as gases at standard temperature and pressure. As a result, merchant market end-users of olefins only represent a very small percentage of the total market.

Figure 3.2 Global Olefins Supply and Demand Balance



Source: Nexant

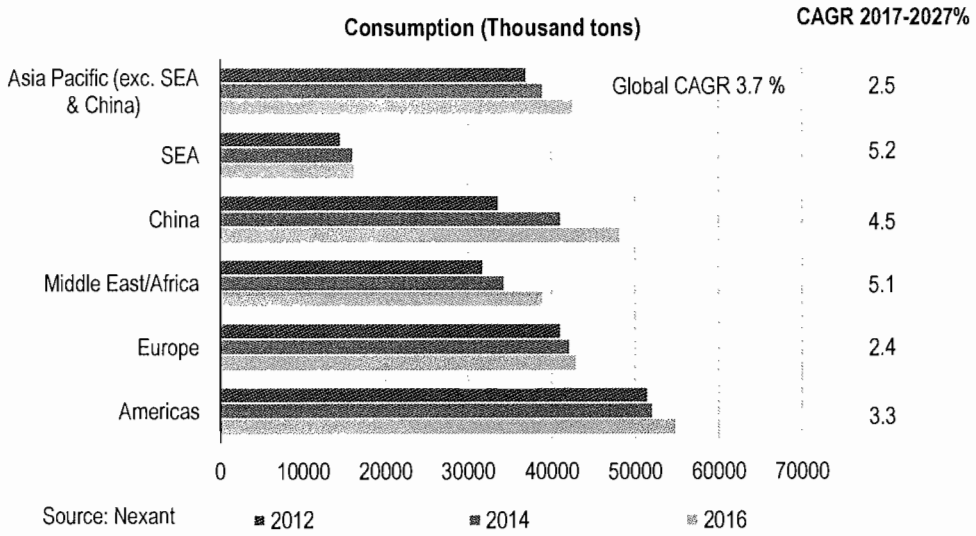
Olefins demand recovered in 2015, following very low growth in 2014. Part of the fall in demand in 2014 was due to the falling oil price, which triggered widespread destocking in derivative value chains, and part of the recovery in 2015 was due to restocking. The fall in oil prices was itself driven partly by weaker economic sentiment, particularly regarding recently high performing economies such China, Russia, and Brazil. The global olefin market grew at 4.1 percent in 2016, relatively the same level of market growth in 2015. Producers are adjusting to the idea of lower long term growth in China, however current consumption remained fairly robust in 2015-2016. Economic issues in other regions such as Europe and the US appear to be easing. The US especially is forecast for a sustained recovery associated with new ethylene derivatives capacity developments tied to shale gas. The European market recovery appears more fragile in comparison. Polyolefins remain the main drivers of the demand improvement and consumption driver for the olefins business.

The coal-based olefins industry in China has shown itself to be resilient despite lower oil prices. The industry has proven robust in the new lower oil price environment and some additional projects continue to be confirmed. Some methanol projects in China have been built which require the highest value market price type of coal such as anthracite. Most MTO developments are based at mining sites, often using standard thermal coal or in some cases low-grade coals.

Nexant forecasts average utilisation levels to remain fairly steady over the forecast period at around approximately 85 percent despite significant capacity additions being planned.

China is the largest market for ethylene in Asia, accounting for around one-third of regional demand. Despite China's economic issues and a slowdown in the construction of new steam cracker complexes, which have driven ethylene consumption growth in recent years, the completion of numerous new integrated MTO complexes are expected to drive ethylene consumption at relatively high rates over the coming years. The country aims to improve its self-sufficiency in olefins production through making use of its rich coal resources and by investing in propane dehydrogenation facilities to make propylene. With the large demand base, Nexant forecasts demand growth levels of olefins in China at a CAGR of approximately 4.5 percent over the period 2017-2027.

Figure 3.3 Overview of Olefins Consumption by Region



Source: Nexant

In SEA, Malaysia and Indonesia are estimated to experience relatively rapid ethylene market growth as a result of new derivatives capacity additions, while growth in Thailand and Singapore is set to fall, following a recent period of expansion. Nexant forecasts demand growth levels of olefins in SEA at a CAGR of approximately 5 percent over the period 2017-2027. Demand for olefins in this region is mainly driven by polyolefins, ethylene oxide/ethylene glycol, and ethylene dichloride (EDC)/vinyl chloride monomer (VCM).

In the rest of Asia Pacific (excluding SEA and China), demand is mainly concentrated in North East Asian countries including Japan, South Korea and Taiwan currently accounting for three-fourth of regional demand with the remaining of around 25 percent in India and others. However, significant demand growth in this region is mainly driven by the rapid growth in India. India is expected to demonstrate the strongest growth in Asia as a result of the development of new cracker complexes serving rapidly expanding derivatives markets. Polymer consumption in India is poised to grow considerably, underpinned by new developments of various factors such as packaging applications, infrastructure growth, improved agriculture, health care, and automobile sectors, and increasing disposable income. The ethylene market in India is mainly for polyethylene, ethylene oxide/ethylene glycol, and vinyls production. Apart from India, Pakistan is reliant on imported ethylene to serve its EDC/VCM production, having no local production of ethylene.

The Middle East/Africa is estimated to grow at around 5.1 percent over the same period. In contrast, demand growths in Europe and the Americas are forecasted at approximately 2-3 percent.

3.1.2 Forecast Pricing and Spreads

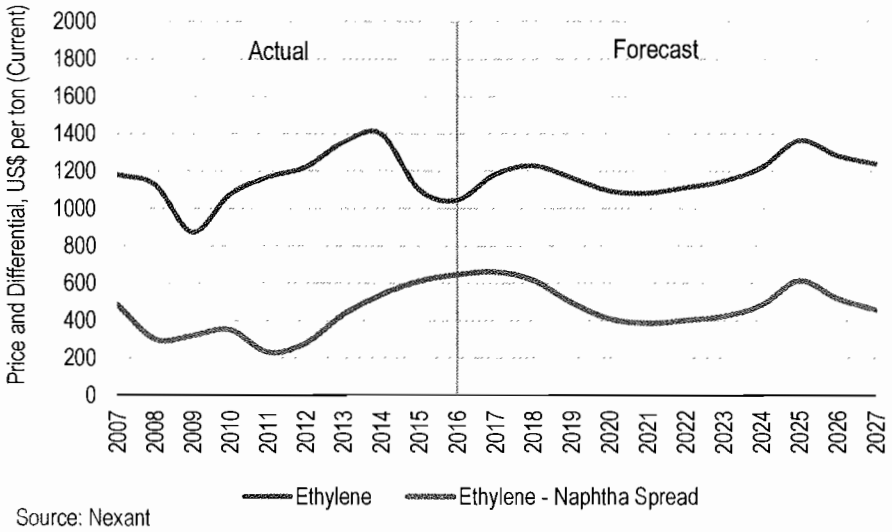
3.1.2.1 Ethylene

Ethylene is typically sold as a bulk commodity, with strict product specifications offering little scope to differentiate sources of ethylene. Ethylene economics demonstrate basic commodity theory such that prices are largely dictated by the cost of production plus a margin. The magnitude of the margin is influenced by the strength of the market as measured by the industry average operating rate (total production over total capacity). As operating rates rise, absorbing marginal production capacity, so producers can generally command higher margins. Many different factors may influence the negotiation of ethylene price settlements:

- Recent and expected trends in production costs - especially price movements in the principle feedstock naphtha. Production costs are the primary focus of producers in setting initial offer prices, with a premium over variable costs critical to ensure incentive for incremental production.

- Recent trends in steam cracker profitability. Variable cost breakeven defines a short term floor to pricing in weak markets, with no incentive for processing incremental feedstock should prices drop lower. Full cash costs must be covered in the longer term.
- Recent trends in margins of key ethylene derivatives, particularly polyethylene. PVC margins tend to have little influence on determining ethylene prices, despite buyers in the vinyls sector participating in negotiations. This is due to the relatively low ethylene content in PVC, and the modest contribution to production costs.
- The supply/demand balance for ethylene. As ethylene is not easily stored and storage capacity is extremely limited, the supply/demand balance is normally monitored by the utilisation rate of crackers rather than by movements in inventories.
- Ethylene prices in other regional markets. The volume of ethylene cargoes traded in deep sea markets is relatively small, due to high costs, and limited infrastructure for the required refrigerated tankers. Extensive global trade in the principle derivative, polyethylene, constrains divergence in regional ethylene prices.

Figure 3.4 Ethylene Price and Naphtha Spread
(Ethylene: Spot CFR SEA, Naphtha: MOPJ)



Source: Nexant

The primary drivers of ethylene price projections are cost of ethylene production plus a return on investment, related to operating rate. The largest cost component of the naphtha cracker is acquiring feedstock, with around 3 tons of naphtha required per ton of ethylene. Hence, the ethylene-naphtha price spread is an indicator of naphtha cracker's profitability. Feedstock prices are projected to follow trend projections for crude oil. Meanwhile, the cracker generates significant co-product revenue from sale of propylene, mixed C_4 and aromatics co-products. The value of the co-products tends to increase as respective markets tighten towards the peak of the petrochemical cycle. Net feedstock costs, after crediting revenue from co-products thus tend to ease towards the peak in the petrochemical cycle.

The low oil environment from late 2014 has narrowed the relative cost position of naphtha cracking to ethane-based and coal-based production routes. Meanwhile, the extreme length in Asian propylene supply has adversely impacted MTO production economics, where higher propylene by-product yielded per ton of ethylene produced in comparison to naphtha cracking. Nevertheless, most MTO developments are being made at mine-mouth economics such that these MTO projects are developed close to coal mining sites, supporting integrated economics and recent operating rates.

Asian ethylene plant operating rates are forecast to gradually ease in the medium terms owing to new capacity additions across the region. The main drivers are coal-based capacity in China, and, to a lesser extent, new ethane-based ethylene capacity in the United States. The first CTO units previously achieved strong operating rates and financial performance relative to steam cracking, and this success has spurred development of other projects. As a result of lengthening ethylene supply, margins for Asian ethylene producers are forecast to gradually decline over the next few years. Return on investment of a standard naphtha cracker in Asia is then assumed to strengthen to a peak in the long term, justifying the high investment for new capacity, reflecting ongoing industry cyclicality.

3.1.2.2 Propylene

The bulk of Asian propylene capacity is composed of co-product processes, with steam crackers supplying nearly half and refinery upgrading processes contributing more than a quarter of available capacity. Since the majority of propylene is produced as a co-product, it is generally inappropriate to relate propylene prices to a cost of production. The major influences on propylene price movements can be attributed to fluctuations in the supply/demand balance and the cost/value of the incremental supply and alternative uses.

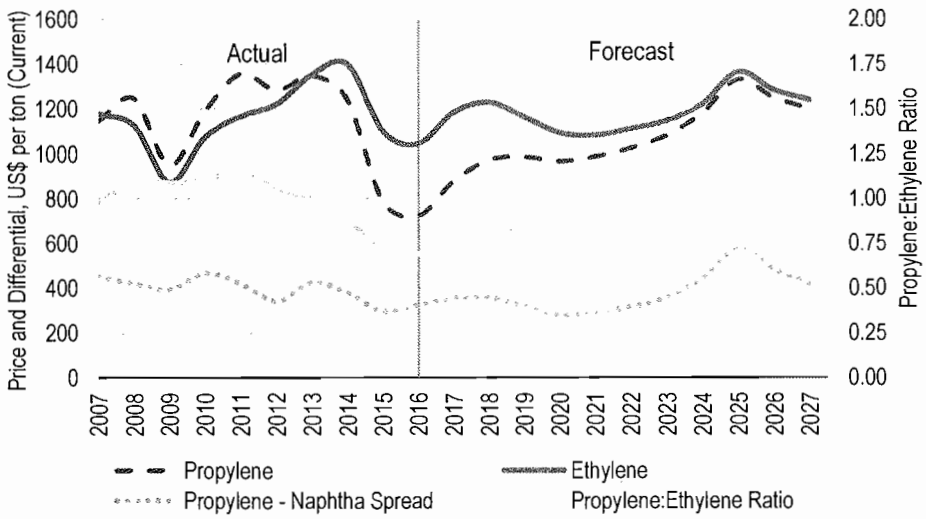
Key supply side issues typically include:

- Current and expected production economics of the naphtha cracker, the principal supply source. With a propylene yield of about 0.5 tons per ton ethylene in a standard severity naphtha cracker, propylene prices have a strong influence on costs and profitability.
- The implied cost of lower severity naphtha cracking. Lowering the severity of cracking increases the yield of propylene, but at the expense of ethylene, C_4 and aromatics. The cost implications of operating in a lower severity mode are tied to the relative strength of co-product markets.
- The cost of extracting propylene from refineries, allowing for the alternate value of refinery propylene to refinery end-uses (including fuel, LPG, polygasoline and alkylate).
- The cost of incremental propylene supply from on-purpose technologies including propane dehydrogenation, as well as methanol-based technologies including methanol-to-olefins and methanol-to-propylene.
- The marginal cost of imports, with shortening co-product supplies from crackers and refineries set to draw more imports into Europe through the forecast.
- The recent price of propylene sold into spot markets. Although volumes sold into spot markets are very much less than contract volumes, spot prices often provide a key leading indicator to contract settlements in the short term.

Key issues on the demand side are likely to include:

- The competitiveness of propylene derivatives compared to other exporting regions. The Middle East has developed to be the principal global exporter of polypropylene, after diversifying from its initial focus on polyethylene in recent years.
- The relative cost of polypropylene production versus competing polymers (most notably high density polyethylene in injection moulding applications). Consumers in lower value applications have opportunity to substitute polypropylene with high density polyethylene. Prices of both resins and the associated cost of feedstocks must remain closely bound to preserve consumption of both products in competing markets.
- Demand for propylene derivatives relative to ethylene derivatives. With a large tranche of propylene supplied as a co-product of ethylene production at crackers, supply is heavily shaped by investments in ethylene supply.

Figure 3.5 Olefin Price Ratio and Propylene-Naphtha Spread
(Olefin: Spot CFR SEA, Naphtha: MOPJ)



Source: Nexant

Historically, Asian propylene prices largely followed ethylene prices, with some volatility depending on the relative strength of each market. Ethylene markets in SEA lengthened between 2008 and 2011 as ethylene cargoes were imported from the Middle East. Meanwhile Asian crackers increased throughput of LPG and lighter feeds, which gave lower propylene yields. As a result, the propylene market tightened relative to ethylene, and prices outpaced those of ethylene.

The situation has since reversed, as ethylene markets tightened considerably while propylene market weakened. Even with strong demand growth in propylene derivatives relative to those of ethylene derivatives, the large capacity increase in China suppressed Asian propylene operating rates in 2013, bringing ethylene and propylene prices towards parity. The relatively strong ethylene market coupled with rapid development in on-purpose propylene units decreased the propylene to ethylene price ratio towards 0.9 through 2014. The price ratio has further fallen below 0.7 in 2016, the lowest in the past two decades, caused by large amounts of refinery-based and on-purpose propylene capacity coming onstream.

Further methanol-based technologies and propane dehydrogenation (PDH) is expected to maintain pressure on propylene prices and its relative strength against ethylene. Propylene prices will maintain a discount to ethylene in the medium term. The discount is forecast to ease in the longer term moving both prices towards parity, as demand catches up with new on-purpose production capacities.

The majority of propylene in Asia is forecast to continue to be supplied as a co-product from steam crackers throughout the forecast period. Projected profitability of naphtha crackers is discussed in the ethylene section. The profitability of marginal sources of supply will be strongly influenced by movements in the supply/demand balance for propylene. The proportion of propylene supply from on-purpose sources is expected to increase as incremental supply from the traditional steam cracker sources will be insufficient to balance demand growth. Further investment in on-purpose supply sources is expected in the forecast.

Although demand is expected to grow relatively strongly in the medium term, margins are projected to remain around the same level before declining to the lowest point around 2020-2021, reflecting enduring oversupply. As demand catches up with the supply, margins will recover and reach a new peak around 2025 in the long term.

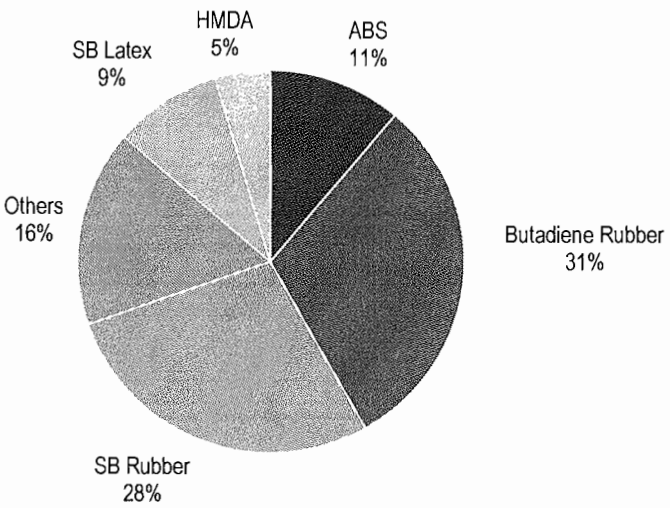
3.2 BUTADIENE MARKET

3.2.1 Global and Regional Overview

Butadiene is a feedstock for the production of a wide variety of synthetic rubbers and polymer resins. In the case of synthetic rubbers, butadiene can be homopolymerised (polybutadiene or butadiene rubber, BR), or copolymerised with a number of monomers, including styrene (to produce products such as styrene butadiene rubber – SBR, and styrene butadiene styrene – SBS) and acrylonitrile to produce nitrile rubber (NBR). Butadiene is also consumed in the production of engineering resins, notably acrylonitrile butadiene styrene (ABS), and naphthalene dicarboxylic acid. Butadiene is used as a feedstock for hexamethylene diamine (HMDA), laurylactam and now caprolactam for the production of different nylons.

Global butadiene demand growth was estimated at 3 percent in 2016, after a strong recovery year at 3.8 percent in 2015 due to challenges in the automotive industry and substitution pressure from natural rubber. The automotive sector is a key driver for butadiene demand, as more than half of global demand is currently for synthetic rubber production. The end to the slump in crude oil and rubber prices also contributed to a significant rebuilding in inventories of butadiene and its derivatives, which in turn let to the recovery in butadiene demand in 2015-2016.

Figure 3.6 Global Butadiene Consumption by End Use *(2016)*



Source: Nexant **Total Global Demand = 11 million tons**

Acrylonitrile butadiene styrene (ABS) and hexamethylenediamine (HMDA)/nylon also find use in vehicle components, and the fortunes of the butadiene industry are thus closely tied to developments in the automotive industry. While increasing wealth in developing countries provides the opportunity for ongoing growth in vehicle ownership and usage, there are trends in developed regions having the opposite effect. The role of automobiles as aspirational objects in some cultures is diminishing, and young urban populations increasingly view owning their own automobile as unnecessary and less desirable due to concerns over the environmental effects of motoring. Initiatives such as car-pooling and flexible leasing provide a means of reducing the total number of new vehicle purchases and the number of vehicles in circulation.

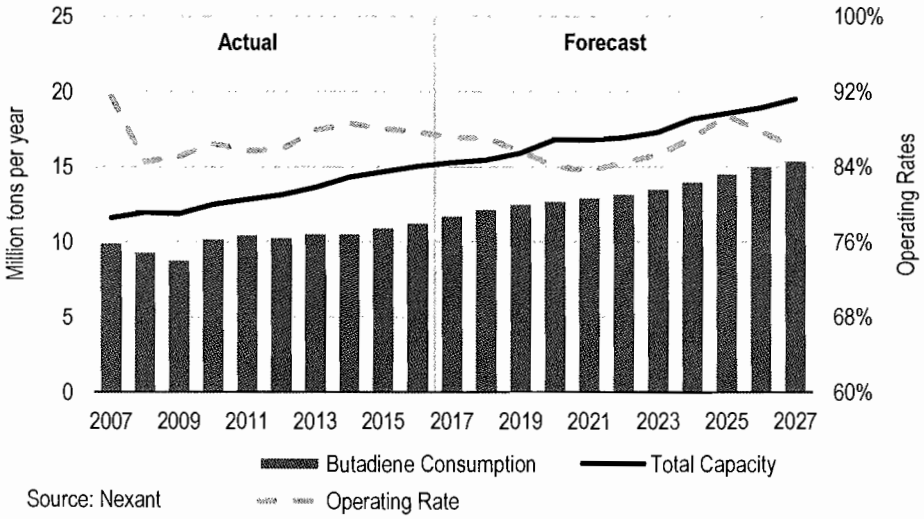
The Asian market has been particularly active building new butadiene and butadiene derivatives capacity, supported both by upstream developments (refinery and cracker projects) and regional demand, led by the ongoing development of vehicle and tyre production. The relocation of automotive industries to Asia increased synthetic rubber demand through tyre production. ABS demand also benefits from a variety of

automotive applications, and demand into HMDA for nylon 6,6 production is driven by use of nylon tyre cord and resin for injection moulded components. Additional global demand for butadiene in recent years was almost entirely focused in Asia Pacific where significant new derivatives capacity was established, particularly in China and South Korea.

The market in North America has declined over the last ten years as a result of diminishing supply and competitiveness.. Demand is also under pressure from imports of both commodity elastomers and tyres. The anti-dumping duties imposed on Chinese tyre imports provided minimal relief for local tyre producers, as other Asian suppliers rapidly replaced the imports from China. With U.S. producers apparently unable to recover market share in the commodity tyre markets, and tightness on C4s (byproduct from naphtha crackers, which contains butadiene) continuing to restrict butadiene supply, the U.S. butadiene market is set to remain challenged.

The rapid emergence of major automotive markets in developing economies now outweighs the negative effect of the maturing markets in developed regions. The cost of transporting butadiene remains a significant competitive disadvantage for non-integrated consumers, but there remain many consumers with import requirements which have a sufficiently strong downstream position to sustain their businesses. Butadiene supply is comparatively plentiful in much of Asia, allowing Asian exporters to become increasingly competitive, and thus supporting Asian butadiene consumption at the cost of consumption in the United States.

Figure 3.7 Global Butadiene Supply and Demand Balance



Source: Nexant

Asia is the largest butadiene consumer in the world, representing more than half of global butadiene demand in 2016. China is by far the largest butadiene consumer in Asia Pacific, accounting for 44 percent of total regional demand. Chinese butadiene demand in every sector has shown high growth rate of about 6-16 percent during 2000-2012, due to the development of downstream business in the country. Butadiene Consumption in China has tripled since 2000, following massive capacity development of synthetic rubber and latex, SBS and ABS in the country. Nevertheless, China still needs to import these elastomers and polymers to meet domestic demand. On-going developments in butadiene derivatives is also supported by the Chinese government, but is limited by butadiene availability.

In SEA, demand for butadiene is mainly concentrated in Malaysia, and Thailand. The primary demand driver for butadiene in Malaysia in recent years has been the development of NBR latex production while the consumption in Thailand increased because of additional styrene butadiene rubber (SBR) capacity. In Indonesia, SBR and SB latex dominate butadiene consumption. Indonesia is a large natural rubber and

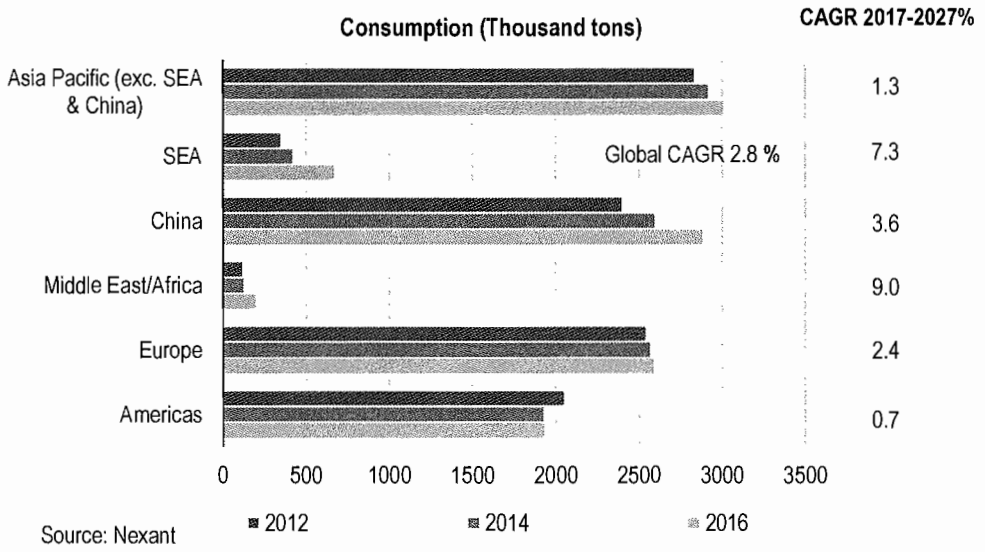
tyre producer and the automobile production is growing quickly. Further demand growth for butadiene is expected to come from BR and SBR. Singapore has been a significant producer of butadiene, but has had very limited consumption. Therefore, it is expected to remain dependent on export markets.

Demand in Asia Pacific (excluding SEA and China) is mainly focused in South Korea, Japan and Taiwan, together accounting for 90 percent of total regional demand with the remaining of 10 percent in India in 2016. Demand growth in those North East Asian countries is forecast to exhibit limited growth at less than 0.5 percent per year over 2017-2027 while India is expected to show strong demand growth at 7.7 percent per year over the same period. In India, BR remains the largest end-use of butadiene. Continued expansion of both BR and SBR will provide strong butadiene demand growth in both sectors. Growing butadiene supply is expected to drive ongoing derivative expansion both to replace derivative imports and to provide a cost-effective means of exporting excess butadiene.

Over the last few years, the Middle East has emerged as a net exporter, due to new extraction capacity. However, butadiene availability for exports would be limit by downstream derivatives development in the region.

Western Europe is currently the main supplier of mixed C4, but the volume is set to decline sharply due to steam cracker closures, and the increasing preference for LPG and indeed imported ethane feedstock at European crackers. As a butadiene exporter, Europe (mainly from Western Europe and Eastern Europe) will remain advantaged in butadiene derivatives and will continue to export to North America, and Asia.

Figure 3.8 Overview of Butadiene Consumption by Region



Source: Nexant

3.2.2 Forecast Pricing and Spreads

The strength of the automotive industry is a key influence on butadiene values from the demand side.

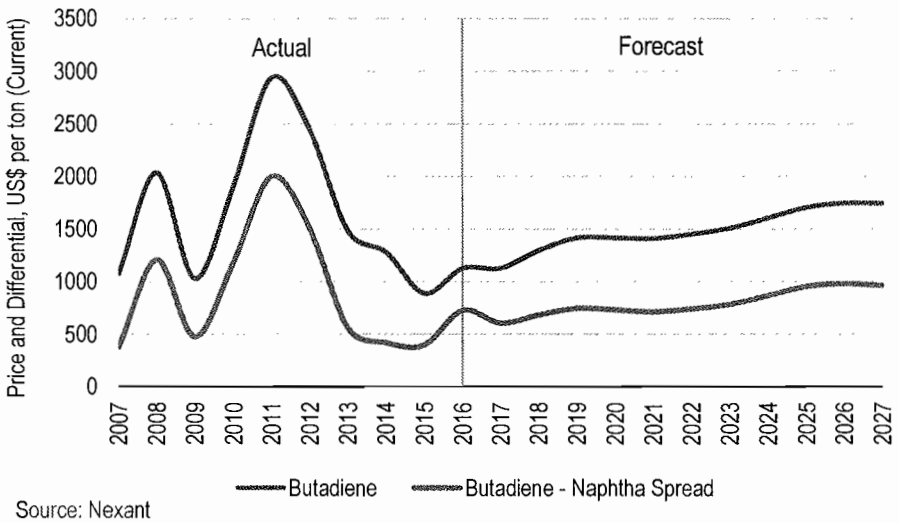
Most of the synthetic rubbers derived from butadiene compete either directly or in blends with natural rubber. Some consumers readily switch consumption of synthetic and natural rubbers to secure best value, closely binding their prices. As with many natural commodities, prices for natural rubber have been immensely volatile in response to uncertain supply characteristics influenced by climatic conditions. Lead times in excess of 5 years to establish full yields from new plantations can heavily constrain supply in the short term. Rapid changes in actual demand and speculation of future prospects for natural rubber have magnified volatility in prices. Natural rubber prices surged from a floor of US$1,200 per ton at the start of 2009 to peak in excess of US$6,000 per ton at the start of 2011 before abruptly retreating again.

- The cost of mixed C_4 feedstock dominates production costs for butadiene, and is the most influential driver of butadiene price from the supply side. In addition to butadiene extraction, other alternative uses for the mixed C_4 stream, influences valuation of mixed C_4 stream and butadiene production economics.

The key drivers in determining Asian butadiene prices are:

- Cost of production (dominated by mixed C_4 feedstock value)
- Inter-regional butadiene price relationship and the cost of freight between regions.
- The profitability of butadiene derivative products (most notably, BR, SBR, ABS and latex)
- The price of alternative sources of natural rubber
- The butadiene supply/demand situation (Butadiene supply has been constrained by restricted availability of mixed C_4 feedstock from crackers)

Figure 3.9 Butadiene Price and Naphtha Spread
(Butadiene: Spot CFR SEA, Naphtha: MOPJ)



Source: Nexant

Production at many butadiene extraction units is restricted by limited availability of C_4 feedstock. The cost advantage of cracking light feedstocks in an environment of high crude oil prices tightened availability of C_4 across the globe. Butadiene profitability peaked in 2008, despite the record high price of C_4 feedstock. Demand collapsed in 2009 as the global financial crisis hit the automotive industry particularly hard.

Butadiene profitability climbed sharply in 2011. Severe shortage of mixed C_4 feedstock replicated the situation in 2008. Natural rubber prices lifted value of synthetic rubbers and butadiene monomer. Record high natural rubber prices, averaging $4,800 per ton in 2011, supported robust growth for alternative synthetic rubbers. The natural rubber price spike was short lived. Average butadiene prices plunged in 2012 and 2013. Despite easing feedstock cost pressure, weak Asian butadiene demand depressed profitability.

The previously strong profitability had encouraged a number of investments in on-purpose dehydrogenation and traditional mixed C_4 extraction units. Over 2012-2014, China brought online five dehydrogenation units, along with other capacity additions from other Asian countries resulting in margins dropping towards historical lows in 2013-2014.

Profitability of butadiene production in Asia improved moderately in 2015, supported by lower conversion cost along with a plunge in crude oil prices as well as some capacity closures. Margins in 2016 continued to improve, due mainly to several temporary production disruptions including Shell's cracker in Singapore and several other temporary closures in North-East Asia.

Profitability of butadiene production from naphtha is forecast to improve moderately in the forecast, supported by the trend of lighter feedstocks for steam crackers around the world as well as emerging alternative routes to ethylene production. The margins are expected to be shared both by butadiene extraction from mixed C_4 as well as mixed C_4 production from naphtha. Future peaks in profitability are however unlikely to match those in the recent history. Interest in on-purpose production via butylene dehydrogenation (BDH) is expected to act as a swing source of supply. The facilities can provide competitive butadiene supply when market prices are favourable, but may be idled during price downturns. Steam crackers are forecast to remain the largest source of butadiene. The preference for cracking lighter feedstocks and penetration of olefins form coal and methanol is expected to counter any lengthening supply from on-purpose technologies.

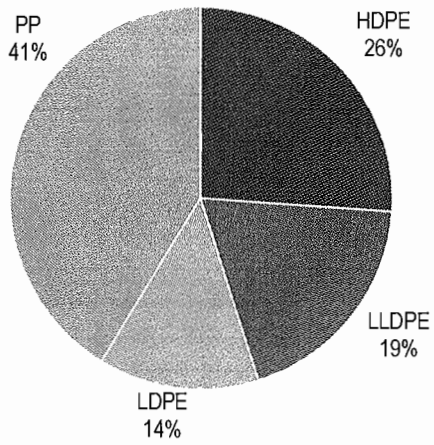
3.3 POLYOLEFINS MARKET

3.3.1 Global and Regional Overview

Polyolefins are commodity thermoplastic polymers consisting of long chains of the monomer ethylene or propylene, and of these, polyethylene is the world's most widely-consumed thermoplastic. There are three main types of polyethylene; Low Density Polyethylene (LDPE), Linear Low Density Polyethylene (LLDPE) and High Density Polyethylene (HDPE). These plastic polymers are used in a wide range of market segments including consumer goods, automotive, construction materials, packaging and general industrial and agriculture.

As individual polyolefin, polypropylene had the largest share of the global market, accounting for more than 41 percent. HDPE had the second largest share, at 26 percent. LLDPE is expected to have the highest short-term and long-term growth rates and will increase its share of the global market to 21 percent by 2027. Polypropylene will have the second highest growth rates and increase its share to 42 percent. HDPE will maintain its 26 percent share, while LDPE will see its share decrease to 11 percent.

Figure 3.10 Global Polyolefins Consumption by Type
(2016)



Total Global Demand = 155 million tons

Global demand for polyolefins was approximately 155 million tons in 2016 and Nexant forecasts this to grow at a CAGR of 3.9 percent over the period 2017-2027. The global polyolefins market is increasingly dependent on Chinese demand growth Nexant forecasts polyolefin demand in China to grow at approximately 4.7 percent over the period 2017-2027. Total polyolefins demand in China is estimated at approximately 46 million tons in 2016. Certainly, strong domestic demand in China remained critical for growth. Three prominent engines drive the Chinese economy including investment, export and domestic demand.

North America continued to show positive growth. Nexant forecasts growth at approximately 2.9 percent CAGR over the period 2017-2027. Demand prospects in North America are supported by the rapid development of the Mexican economy. The U.S. accounts for about 80 percent of total polyolefins demand in North America. The U.S. has long been considered a mature market for polyolefins, with growth rates that remain related to GDP and population growth. While demand patterns are still expected to remain stable and to follow GDP, the industry is in the middle of unprecedented developments that will rapidly alter the manufacturing of petrochemicals. As a result of the expected shale gas developments, the development path of polyethylene and polypropylene in the United States are set to diverge unless polypropylene prices become comparable to polyethylene prices in North America.

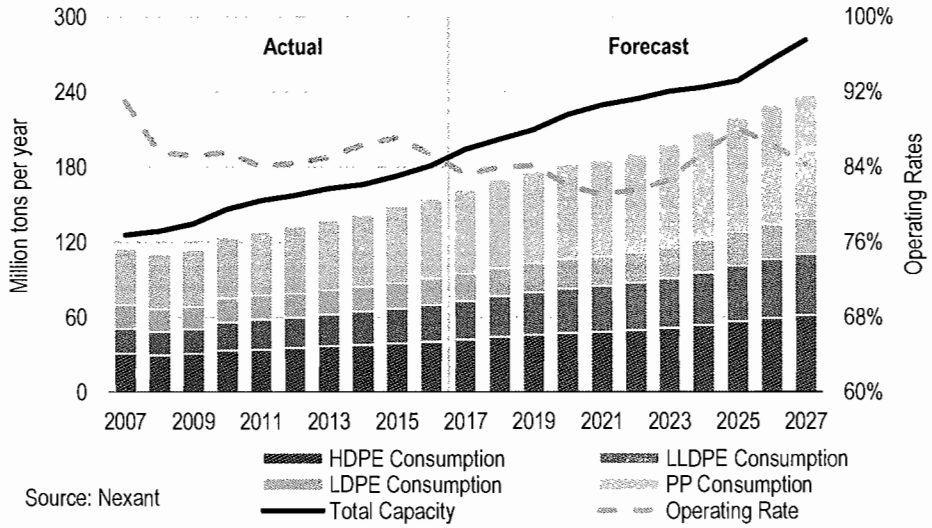
In Europe, the general improvement in the economy across the majority of Western European countries supported some positive sentiment in the region. Demand for polyolefins in Europe is expected to grow at around 2 percent over the period of 2017-2027. Polypropylene had the strongest performance of all the polyolefins, outstripping GDP growth.

The Middle East and Africa are comparatively immature markets for polyolefins, and are expected to grow at above average rates. The regions together constitute around 10 percent of global demand, and have a strong growth outlook due to high GDP and population growth, and currently a low per-capita consumption. Nexant forecasts to grow at 4.8 percent CAGR over the period 2017-2027.

Asia Pacific is the biggest market at around half of the global demand. Nexant forecasts total consumption growth in the region at approximately 4.5 percent over the period of 2017-2027, which is above global average.

From 2013 to 2016, operating rates for polyolefins averaged at over 86 percent on average. Nexant forecasts industry operating rates to decline of the current peak as new capacity additions come on stream.

Figure 3.11 Polyolefins Global Supply and Demand Balance



Source: Nexant

Demand for polyolefins in Asia is largely concentrated in China of which the country alone accounts for nearly 60 percent of total regional demand. China's economy faces overcapacity and investment slowdown in its manufacturing and real estate sectors, increasing risks of non-performing loans and private financial defaults, as well as the general impact of the weak global economy. China has experienced a significant decline in GDP growth, but it is anticipated that the sharp decline will be followed by a long period of flat but stable growth. Large volumes of polyolefins are exported from Asia, particularly China, in the form of manufactured goods such as woven sacks, luggage, crates and containers, packages, and a wide range of other goods. The electrical and electronics industries have been increasing rapidly in the last few years due to major domestic consumption and product exports.

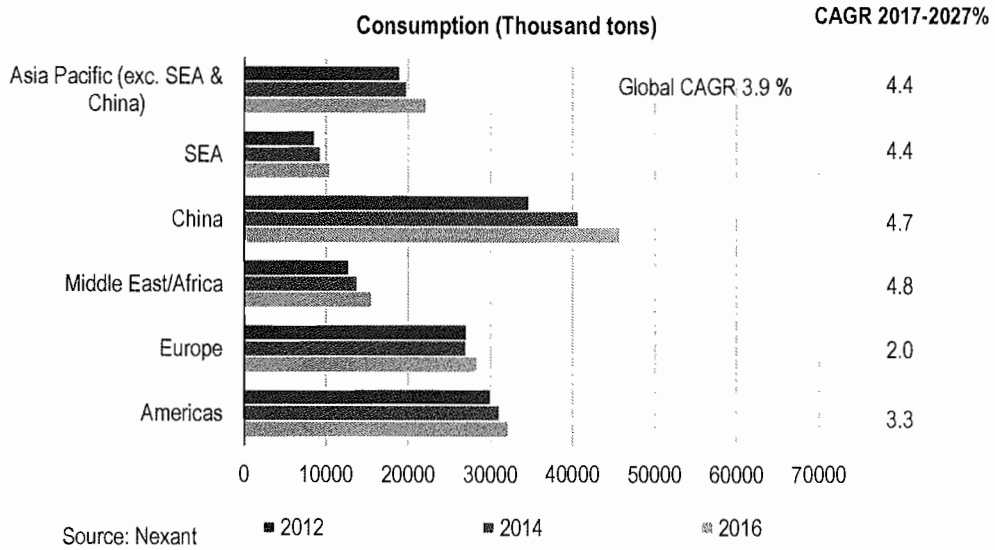
In SEA, Indonesia and Thailand are by far the largest polyolefins consuming countries while Vietnam is emerging as a competitive manufacturing nation. Nexant forecasts demand growth in SEA, where markets are less mature and product substitution of basic materials is having a greater impact on consumption growth, to grow at 4.4 percent CAGR over the period 2017-2027. In the short-term future, polypropylene is forecast to continue growing at a faster rate as compared to polyethylene. For

polypropylene, demand by end use is different in each country. Injection moulding dominates Thailand's polypropylene market while film and fibre applications are the largest end use in Indonesia and Vietnam.

In Asia Pacific (excluding SEA and China), demand is mainly driven by the rapid growth in India with the current demand was estimated at around 40 percent of total regional demand; followed by Japan, South Korea and Taiwan. Key drivers for polyolefins growth are likely be similar to the past, driven by growth in sectors such as automotive, agricultural, household items, electrical appliances, and retail. The demand is forecast to grow at 4.4 percent CAGR over the period of 2017-2027.

The Middle East/Africa is estimated to grow at around 4.8 percent (CAGR) over the same period. In line with olefins market, demand growths in Europe and the Americas are forecasted at approximately 2-3 percent.

Figure 3.12 Polyolefins Consumption by Region



Source: Nexant

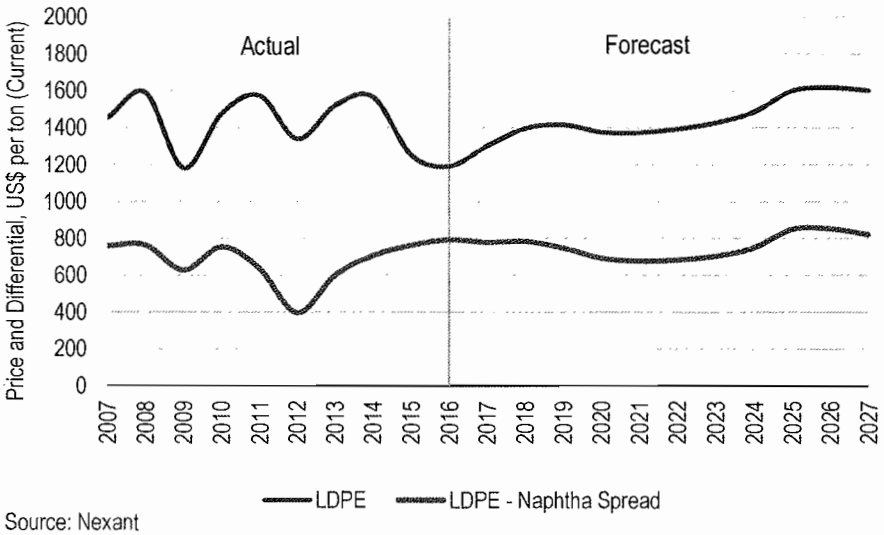
3.3.2 Forecast Pricing and Spreads

3.3.2.1 Low Density Polyethylene (LDPE)

Commodity grade LDPE resin prices in Asia are largely determined by free negotiation between major producers and converters who process the resin into finished products or components for further assembly. Prices displayed in this report are annual averages of the spot CFR SEA price and represent the offshore value of material imported into the region. The following issues heavily influence the settlement of spot prices:

- Current and anticipated LDPE production economics, with costs dominated by the value of ethylene.
- The supply/demand balance for LDPE.
- Price of competing resins, most notably LLDPE.
- Prices in other regional markets and projected trade flows. Asian demand for LDPE is higher than production in the past few years, with imports currently sourced mainly from the Middle East and Western Europe, followed by the United States.

Figure 3.13 LDPE vs. Naphtha Price
(LDPE: Spot CFR SEA, Naphtha: MOPJ)



Source: Nexant

The greatest influences on LDPE prices are the cost of acquiring ethylene feedstock and its value along with LLDPE in commodity films. The LDPE share of total polyethylene market has declined due to substitute by LLDPE. LDPE demand will continue to lag behind other grades, increasingly consumed in higher value EVA and as a blend to improve processing properties of LLDPE in Film applications. LDPE prices are expected to retain a premium to other grades, with a ceiling set by higher value to EVA resins and a floor set by lower cost LLDPE commodity films.

Asian LDPE market lengthened in 2011, with severe substitution pressure by much cheaper LLDPE as well as a rapid decline EVA demand into photovoltaic application. As a result, LDPE profitability plummeted in 2012.

Profitability improved modestly through 2013 and 2014. In 2015, the growth of Asian LDPE/EVA demand overcame capacity addition in the region. This along with the tightness of ethylene market increased margins for integrated producers, but not non-integrated producers due to relatively high ethylene cost. The situation intensified in 2016 as a result of strengthening ethylene prices.

The trend for moving margins up the value chain is common where the industry sector is highly integrated and will continue through the forecast. Capturing the margin on the monomer and minimising margin available at the polymer unit deters new entrants from competing in polymer markets alone. Polyethylene prices will increasingly track ethylene prices, with a modest premium to cover polymerisation costs and a steady margin. Positive variable margins will allow integrated producers to supply incremental resin from ethylene purchased in spot markets when economics are favourable.

With large new capacity expected to start up in Asia and the United States, margins of integrated producers are projected to decline, while non-integrated margins are anticipated to gradually increase. The extension of next downturn of integrated margins will depend highly on the success of new integrated methanol-to-olefin projects in China as well as ethane crackers in the United States in the coming years, while new capacity elsewhere in Asia will be limited to large-scale LDPE unit in India and a few developments of swing EVA/LDPE units and modest expansion through debottlenecking.

3.3.2.2 Linear Low Density Polyethylene (LLDPE)

The main use of LLDPE is in film and packaging applications, where it competes directly with LDPE. The higher tensile strength and superior puncture and tear resistance of LLDPE compared to LDPE increases the value to convertors due to the opportunity to down-gauge and reduce resin consumption. Conversely the higher linearity of LLDPE makes it harder to process the resin. The value of LLDPE to convertors relative to LDPE is further depressed by inferior optical and heat sealing properties. Most convertors blend a proportion of LDPE into the LLDPE resin to gain the optimum mix of mechanical and processing properties. Opportunities to substitute LDPE with LLDPE closely bind the prices of the two resins.

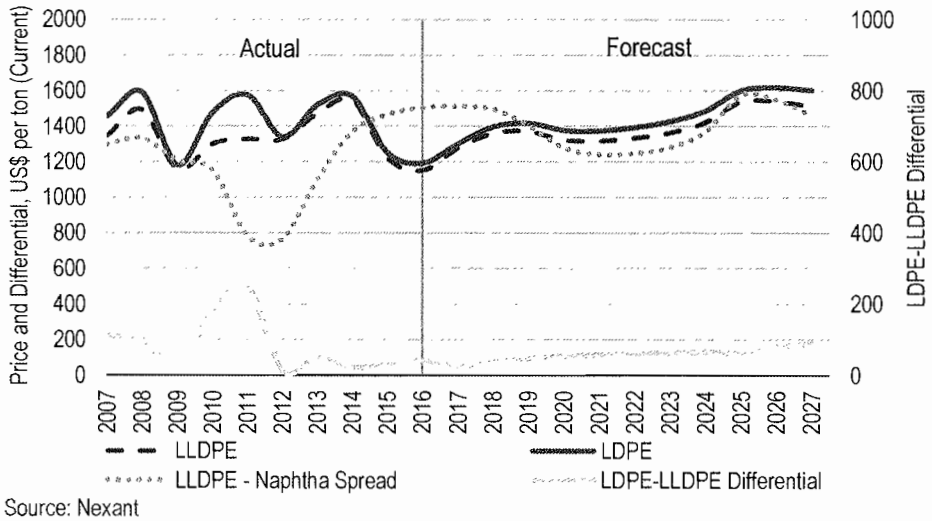
LLDPE is produced by copolymerisation of ethylene with an alpha olefin (most commonly butene, hexene or octene). Modern LLDPE plants operate at significantly lower pressures than conventional LDPE units. Production costs for both grades of polyethylene are similar as the increased cost of acquiring co-monomers is generally offset against reduced capital cost and operating costs of the low pressure LLDPE production process.

LLDPE prices in Asia are generally set by free negotiation between the major producers and convertors. Prices will settle at a balance between the value of the resin to convertors on the demand side, and the costs of production on the supply side.

The following issues typically influence LLDPE spot prices:

- Production economics for LLDPE (most notably ethylene feedstock costs).
- The price of competing polymers (most notably LDPE).
- The supply/demand balance for LLDPE.
- Prices for LLDPE in other regions, and projected trade flows.
- Profitability of upstream steam crackers.
- Profitability of convertors and plastics processors.

Figure 3.14 LLDPE vs. LDPE and Naphtha Prices
(PE: Spot CFR SEA, Naphtha: MOPJ)



Source: Nexant

Prior to 2010, LLDPE prices closely tracked LDP prices. The discount on LLDPE offset the cost burden to resin consumers of its inferior processing properties compared to LDPE, allowing penetration into film markets. The relative position of the two prices has fluctuated recently.

Apart from brief divergence over 2010-2011, profitability of LLDPE production has closely tracked that of LDPE, albeit at a reduced level. Profitability of the two grades of polyethylene has moved together, due to direct competition in most applications, and common exposure to ethylene monomer costs.

Returns for integrated producers are expected to decline in coming years, following significant planned capacity additions primarily in North America and Asia. The extension of the downturn will depend highly on the success of new integrated methanol-to-olefin projects in China as well as ethane crackers in the United States in the coming years, while new capacity elsewhere in Asia will be limited to several cracker developments in SEA and India.

3.3.2.3 High Density Polyethylene (HDPE)

HDPE competes with several other polymers in its different end use applications. In many blow moulding and injection moulding applications, HDPE competes directly with polypropylene, with converters readily able to switch resin to the lowest cost alternative. In the pipe sector, HDPE typically competes with PVC. In the film sector HDPE competes with other grades of polyethylene films, such as high strength bags and liners. Inter-product competition in sectors where consumers can openly substitute products maintains a close link between HDPE and other polymer prices.

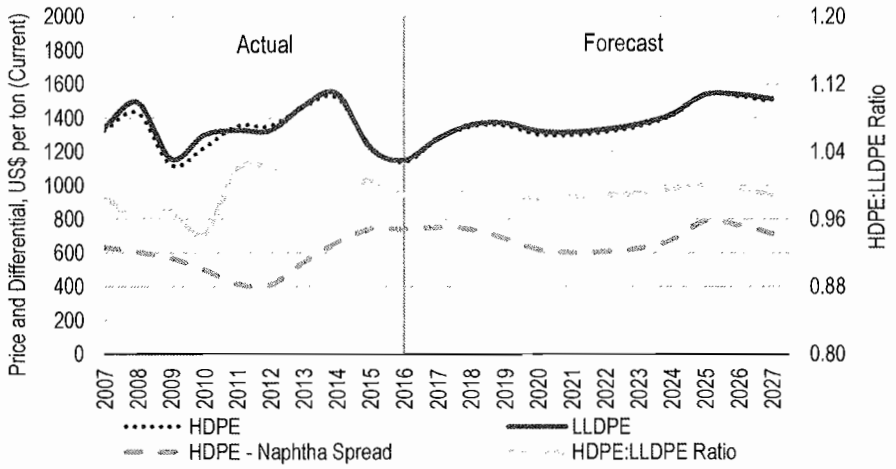
The most efficient modern HDPE production units operate, at low pressures, using a very similar process to LLDPE production. Due to the similar process technologies, some "swing" plants have the capability to switch production from LLDPE to HDPE in response to prevailing production economics and market demand.

Many grades of HDPE resin are sold with properties which optimise resin tailored to requirements of specific end use sectors. In this report, the production economics and pricing are based specifically on a commodity injection moulding grade resin, unless otherwise specified. Prices of other grades will closely follow the marker injection moulding grade, with premiums or discounts dependent upon the value of resin in alternative uses.

HDPE prices in Asian spot markets are negotiated directly between major producers and convertors. Prices displayed in this report are annual averages of the spot CFR SEA price and represent the offshore value of material imported into the region. The following issues heavily influence the settlement of spot prices:

- Production economics for HDPE (most notably ethylene feedstock costs).
- The price of competing polymers (most notably polypropylene, and LLDPE).
- The supply demand balance for HDPE.
- Prices for HDPE in other regions, and projected trade flows.
- Profitability of upstream crackers.
- Profitability of convertors and plastics processors.

Figure 3.15 HDPE vs. LLDPE and Naphtha Prices
(PP and HDPE: Spot CFR SEA, Naphtha: MOPJ)



Source: Nexant

HDPE prices are forecast by balancing the projected production costs (dominated by ethylene monomer feedstock cost), and projected margins against the need for continued competitiveness with other polymers (including polypropylene, PVC and LLDPE) and supply in other regional markets.

Prices of HDPE and LLDPE have tracked each other very closely. The ratio of HDPE to LLDPE has sustained a steady value in a band between 0.94 and 1.02. Recently, Middle Eastern exports to China have been predominantly LLDPE, putting a pressure on LLDPE prices. Despite rising cost of comonomer for LLDPE production, extremely poor LLDPE demand in Asia Pacific in 2012 pushed the ratio above parity. The ratio is expected to maintain close to parity through to 2027, due to the nature of HDPE/LLDPE swing capacity.

Profitability of HDPE and LLDPE production has historically tracked each other very closely. The common production technologies and the ability some producers have to alternate production between the resins have helped keep both markets in balance, and converged profitability of both products. Prices for the two products have typically tracked each other fairly closely considering the similar production costs, dominated by the cost of acquiring ethylene monomer.

3.3.2.4 Polypropylene (PP)

In Asia Pacific, more than one-third of polypropylene is consumed in injection moulding applications, where it competes directly with HDPE and polystyrene. A further approximately 30 percent of polypropylene demand comes from the fibre sector, where it competes with other synthetic fibres such as acrylic fibre and nylon. A smaller proportion of demand comes of about 20 percent from the film sector, where it competes with LDPE and LLDPE. Polypropylene can also be extruded into pipes and thin film containers, competing with both HDPE and PVC.

The most efficient modern polypropylene production units operate, at relatively low pressures, similar to HDPE and LLDPE. Competitiveness of polypropylene relative to other ethylene derived polymers is strongly influenced by the price of propylene relative to ethylene through the cost of acquiring monomer.

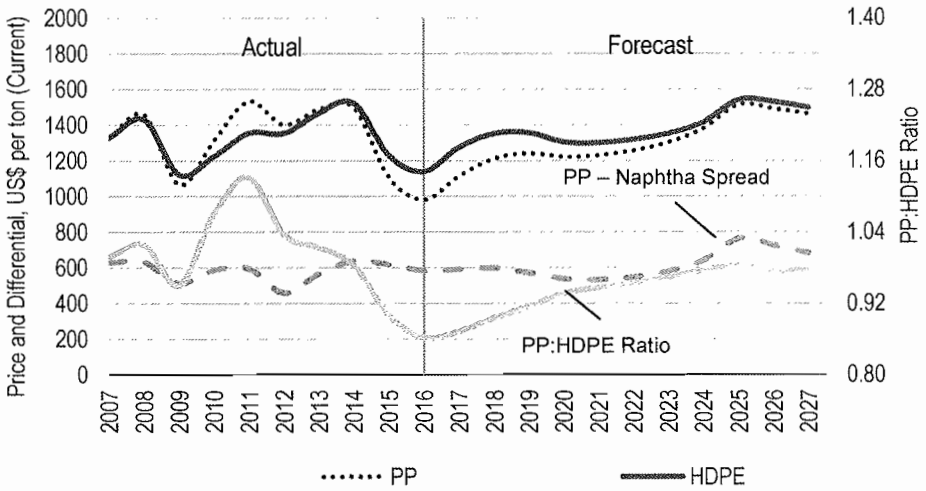
Polypropylene resins are broadly categorised into two generic grades. Homopolymer resins are general purpose resins produced almost exclusively from propylene monomer. Copolymer resins typically incorporate between 5 and 15 percent ethylene co-monomer, improving impact resistance. In this report the production economics of homopolymer injection moulding commodity grade resin are analysed.

Prices and profitability analysis presented in this report are based on the annual average prices for in SEA spot CFR markets. Polypropylene prices in the Asian spot markets are negotiated between major producers and convertors.

Factors which influence price settlements include:

- Production economics for polypropylene (most notably propylene feedstock costs).
- The price of competing polymers (most notably HDPE, polystyrene and PVC).
- The supply demand balance for polypropylene.
- Prices for polypropylene in other regions, and projected trade flows.
- Profitability of convertors and plastics processors.

Figure 3.16 PP vs. HDPE and Naphtha Prices
(PP: Spot CFR SEA, Naphtha: MOPJ)



Source: Nexant

Polypropylene prices are forecast by balancing projected production costs (dominated by propylene cost), and projected margins against the need for continued competitiveness with other polymers (including HDPE, polystyrene and PVC) and supply in other regional markets.

Polypropylene and HDPE prices have historically tracked each other due to direct competition in injection moulding applications. Many convertors can readily switch their resin to optimise costs. The ratio of polypropylene to HDPE prices has sustained a steady value in a band between 0.85 and 1.13. Since 2014, polypropylene prices have dropped below those of HDPE, as propylene to ethylene price ratio drastically declined. The situation is anticipated to sustain in the medium term, supported by propylene oversupply. In the long term outlook, the oversupply situation is projected to improve, maintaining polypropylene and HDPE prices close towards parity.

In 2014, Asian polypropylene prices rose modestly against a decline in regional propylene prices, resulted from relatively strong ethylene and HDPE markets. Relative high HDPE prices boosted polypropylene prices, despite lowering propylene cost amid oversupply polypropylene market. As a result, margins for polypropylene rose and the situation continued through 2015. Despite a further decline in propylene against ethylene prices in 2015, polypropylene prices remained relatively strong, supporting high non-integrated and integrated margins. The margins remained high, but started to decline in 2016 from increasing propylene and polypropylene surpluses.

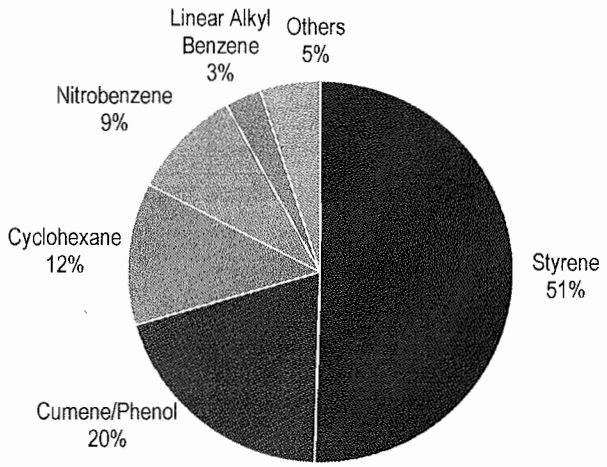
Nevertheless, with projected weakening ethylene and HDPE markets over the next few years, polypropylene prices are anticipated to soften against propylene feedstock. Non-integrated cash margins are however expected to remain above breakeven, owing primarily by relatively poor propylene prices in the medium term. Although the margins are not sufficient for non-integrated polypropylene to be constructed, the positive margins will allow integrated producers to supply incremental resin from propylene purchased in spot markets when economics are favourable. The trend for moving margins up the value chain is common where the industry sector is highly integrated. Capturing the margin on the monomer and minimising margin available at the polymer unit deters new entrants from competing in polymer markets alone.

3.4 BENZENE MARKET

3.4.1 Global and Regional Overview

Benzene has many uses and demand continues to grow despite increasing restrictions and environmental regulations. Creation of styrene is the largest use of benzene, followed by cumene/phenol, cyclohexane and nitrobenzene. Those derivatives are used to produce a wide range of plastics, fibres, resins and films. Benzene is also an excellent solvent for waxes, resins, rubber and various other organic materials, but toxicological properties greatly limit use. Global benzene consumption is estimated to be nearly 46 million tons in 2016. Around half of the demand is used in styrene production. With a broad range of end-uses, benzene consumption growth usually tracks economic performance. The final polymers and fibres produced from benzene derivatives are consumed predominantly in the packaging, automotive, electronics/electrical and construction industries.

Figure 3.17 Global Benzene Consumption by End Use
(2016)



Source: Nexant **Total Global Demand = 46 million tons**

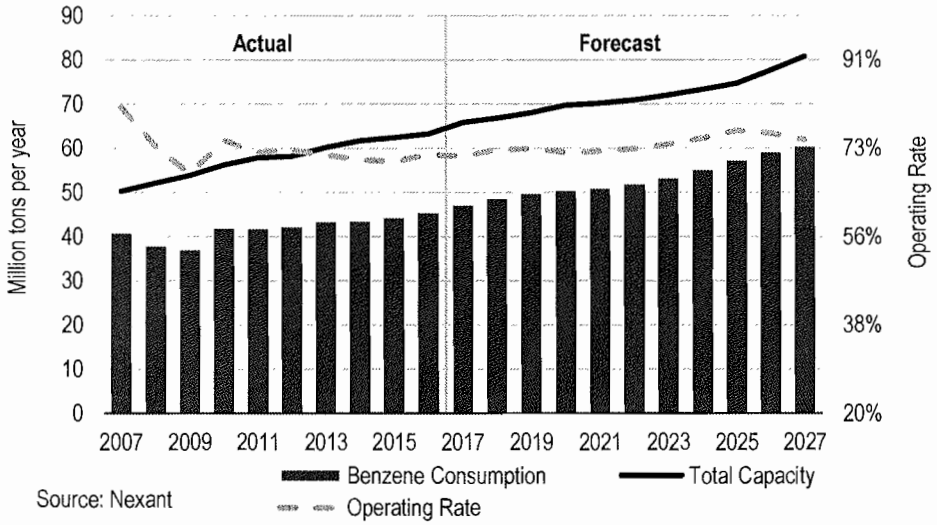
Asia Pacific has continued to dominate global benzene consumption driven by demand of new downstream derivatives capacity of the value chain, while a decline in demand occurred in North America and Western Europe. The majority of future growth is focused in Asia, particularly China, where most of the new downstream derivative plants will be built. Major benzene capacity additions in the Middle East are also enabling major developments of derivatives in the value chain. In contrast, there has been a decline in the competitiveness of downstream derivative producers in the benzene value chain in Europe, reducing demand of benzene in this region, while North America is beginning to benefit from low-cost feedstock and utility prices for benzene.

Although benzene demand is expected to recover from its current level, the number of projects under construction or study is relatively few compared to the period between 2006 and 2011. This is mainly due to the slowdown in pygas additions from steam crackers as new crackers are likely to be focused on utilising low-cost gas feedstock, particularly in the United States. Benzene is extracted or converted from the other components contained in pygas. The wave of new liquid crackers added recently in China is unlikely to be repeated during the forecast period due to the significant slate of new methanol-based olefins production. The incremental olefins demand is expected to be met by coal-based production units, which does not result in any significant volume of benzene.

The majority of new benzene demand will be driven mainly by para-xylene production complexes which aim to support the growth in the polyester sector.

With this combination of factors, lower benzene capacity relative to benzene demand, the global benzene market is forecast to tighten gradually in the long term, raising operating rates from their current level.

Figure 3.18 Global Benzene Supply and Demand Balance



Source: Nexant

Demand for benzene in Asia is largely concentrated in China of which the country alone accounts for nearly 50 percent of total regional demand. Despite the uncertainty around the region's economy, growth in most sectors was improved in 2016, following the dominance of Asian capacity additions in global market, particularly phenol and nylon value chains (which require benzene feedstock). Growth in Asia has been driven by both the benzene demands for markets of benzene downstream derivative products.

The Chinese benzene market has continued to evolve, from importing benzene-derived polymers for finished goods production to importing more upstream benzene derivatives for polymer production. More recently, China has aggressively added benzene derivatives capacity to replace extremely large import requirements, exerting pressure on existing exporters into the country. As a result, China's benzene consumption has grown by about 10.5 percent annually from 2007 to 2016. Healthy growth is also expected in 2017, along with the start-up of new styrene units as well as rising production from recently started up cumene/phenol plants. With relatively low investment in other regions, China is forecast to dominate global benzene demand through growth of benzene downstream derivative products over the next five years.

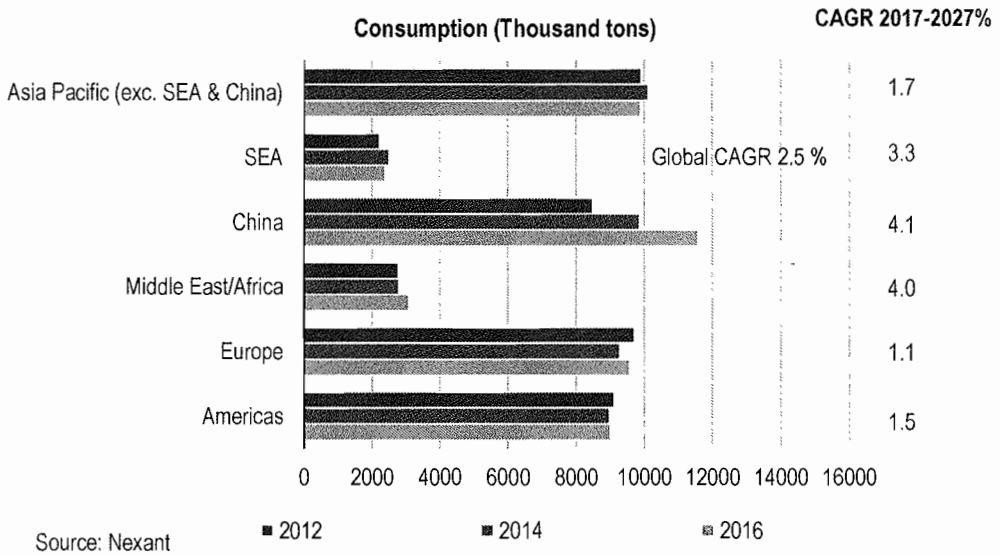
In SEA, benzene demand is largely concentrated in Singapore and Thailand together accounting for around 80 percent of total regional demand. In Singapore, styrene and cumene are major benzene derivatives resulting in benzene consumption. In Thailand, styrene, cumene and cyclohexane are the key benzene derivatives. There is no additional capacity planned for the medium term. Benzene consumption into styrene is expected to grow supported by the growing domestic demand, mainly from the automotive market.

In Asia Pacific (excluding SEA and China), demand for benzene is mainly concentrated in Japan, South Korea and Taiwan together accounting for around 95 percent of total regional demand. However, demand grow is expected to grow at less than 1 percent per year over 2017-2027. Despite a small demand base of only 5 percent of regional demand, the strong demand growth of benzene is expected to be driven by Indian consumption at around 12.3 percent per year supported by most benzene derivatives.

Benzene demand in North America and Europe is expected to see limited growth over the forecast period, with an average annual growth rate of slightly above one percent per year during 2017-2027, respectively. Benzene consumption is driven heavily by styrene production in North America and as demand into styrene derivatives is limited, styrene's consumption of benzene is likely to also experience limited growth.

The capacity base for benzene derivatives in the Middle East/Africa consists mainly of large and competitive facilities in Saudi Arabia and Iran. The demand is expected to grow at 4 percent per year over the same period.

Figure 3.19 Overview of Benzene Consumption by Region



Source: Nexant

3.4.2 Forecast Pricing and Spreads

There are several alternative sources of benzene production in Asia:

- Extraction from pygas.
- Extraction from reformate.
- Extraction from coke oven gas condensates (benzole or coal tar streams).
- Hydrodealkylation of toluene (HDA).
- Disproportionation (TDP) and transalkylation of toluene to xylenes and benzene (this includes selective toluene disproportionation processes which yield a highly para-xylene enriched (up to 90 weight percent) xylenes stream).

Pygas and reformate extraction each account for around 30 percent of the region's benzene capacity. The proportion of pygas has recently declined following an investment wave in para-xylene capacity, plus massive growth in coal-based benzene capacity in China The share of benzene capacity driven by new para-xylene investment in the future is anticipated to increase; however, the proportion of pygas and reformate extraction still remains the major contributor.

Benzene sourced from pygas, reformate and coal may be deemed co-product material as operation of these plants is generally constrained by the supply of feedstock from other product sectors. Pygas is sourced from crackers and supply is principally determined by operating decisions in response to ethylene market dynamics. Reformate is sourced form reformers in the oil refinery and supply is principally governed by operating decisions in response to gasoline market dynamics. Coal tar is sourced

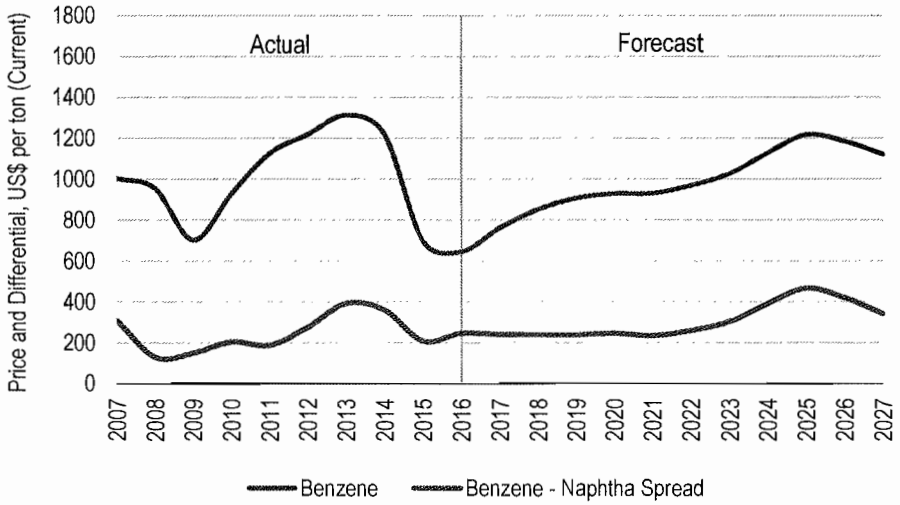
from the coke oven and supply is principally controlled by operating decisions in response to demand for steel.

The low cost of shipping benzene as a bulk liquid supports significant global trade in benzene cargoes. The main importing region is North America due to its preference for lighter cracker feedstocks restricting availability of pygas. The prevalence of trade in benzene ensures close convergence of regional prices. Benzene prices the United States, play a key role in influencing prices in all regions, as it looks to import incremental tons.

The following factors heavily influence benzene prices:

- Production costs of marginal supply sources, particularly toluene hydrodealkylation.
- Gasoline prices which influence the blending values of reformate and toluene.
- Price of other aromatics and economics of conversion to benzene through processes such as dealkylation and disproportionation of toluene.
- Supply demand balance for benzene.
- Strength of key derivative markets (most notably the styrenics sector).
- Benzene prices in regional markets (most notably the United States) and prevailing freight rates.

Figure 3.20 Benzene Price and Naphtha Spread
(Benzene: Spot FOB SEA, Naphtha: MOPJ))



Source: Nexant

Although pygas extraction is the largest source of benzene in Asia, it does not provide any insight into the underlying strength of benzene prices and markets. Benzene margins from pygas assume continuation of a contained aromatics mechanism to value pygas, which inherently provides a steady nominal extraction margin. Production economics of benzene from marginal toluene conversion supply sources have been much more volatile over the last decade, and provide better insight into dynamics of markets and pricing.

The profitability of the benzene production depends markedly upon the assumptions made to value feedstocks and co-products (i.e. petrochemical market price or gasoline blending value). The appropriate valuation mechanism will vary for each individual producer and plant, depending on site configurations and feedstock integration opportunities. The margin for benzene production from gasoline valued feeds is mostly higher than market value feeds. The value of toluene and mixed xylenes to the gasoline blender

are usually lower than the prevailing petrochemical market price, providing the refinery with additional margin to incentivise extraction from the gasoline pool.

Since 2011, supply dynamics has played a very important role in defining benzene prices. Limited availability of pygas has regularly been a consistent positive factor, impacting benzene prices. The recently profitable ethylene market has supported rising ethylene production since 2015, and hence higher output of benzene by-product. This has to some extent lengthened the benzene supply in the region. In 2016, margins for ethylene production in Asia continued to rise. However, supply growth in benzene by-product from ethylene production through 2016 has been limited due to new olefins capacity which does not produce pygas for benzene extraction..

In the forecast, the benzene market is expected to tighten gradually due mainly to limited supply. A continuing recovery in global and regional benzene demand is projected, assuming insignificant impact from high benzene prices on downstream consumption. Meanwhile, the number of new benzene projects will be restricted. This is mainly due to the slowdown in pygas additions from steam crackers as new crackers are likely to be focused on utilising low-cost gas feedstock, particularly in the United States. The wave of new liquid crackers added recently in China is unlikely to be repeated during the forecast period due to new methanol-based olefins projects.

The majority of new benzene capacity will be driven mainly by para-xylene production complexes which aim to support the growth in the polyester sector. With this combination of factors, the global benzene market is forecast to tighten gradually in the long term.

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Section 4 Industry Country Focus

4.1 MALAYSIA

4.1.1 Economic Overview

Malaysia achieved independence in 1957, and has achieved sustainable growth through development of its natural resources and manufacturing. Its GDP growth in 2014 was 6 percent, and reduced to 5 percent and 4.3 percent respectively in 2015 and 2016 affected by low commodity prices, depreciation in the ringgit (RM), and a generally weaker global environment.

The Malaysian economy is envisaged to achieve an estimated GDP growth of around 4.5 percent over the next three years (2017-2019)[2] as it continues to develop higher value and higher margin businesses including increasing exports of petrochemicals. This will be aided by the Refinery and Petrochemical Integrated Development (RAPID) project in Johor, one of the largest refinery and petrochemical projects to be implemented in the next few years, with an anticipated start-up in 2020.

Major investments include large infrastructure projects such as the Mass Rapid Transit (MRT) lines and Kuala Lumpur-Singapore High Speed Rail, which are expected to drive the nation's economic growth. The government also aims to boost consumption by raising disposable income and has plans to expand sectors such as biotechnology and medical equipment as well as knowledge intensive businesses, as a measure to reduce reliance on the country's crude oil and gas resources for growth.

Lower domestic fuel prices due to the decline in global crude oil prices, implementation of minimum wages, and the government's continuous efforts to nurture a skilled country workforce will likely help support growth in domestic consumption.

Table 4.1 Profile of Macroeconomic Factors for Malaysia

	Actual						Forecast					
Malaysia	2007	2009	2011	2013	2015	2016	2017	2019	2021	2023	2025	2027
Population, million	27	28	29	30	31	32	32	33	34	35	36	37
GDP, million current US $	194208	207371	283780	315887	298668	302748	326067	374741	429384	491636	561628	639848
GDP, million 2016 $	202080	208638	236221	260844	290267	302748	316674	346642	379165	414436	451953	491533
GDP deflator Index (2016 = 100)	80.5	85.4	89.6	93.0	97.9	100.0	103.0	108.1	113.2	118.6	124.3	130.2
GDP Real Growth Index (2016 = 100)	66.7	68.9	78.0	86.2	95.9	100.0	104.6	114.5	125.2	136.9	149.3	162.4
Economic Measures												
GDP/Capita (Current $)	$7 166	$7 384	$9 765	$10 455	$9 577	$9 546	$10 109	$11 255	$12 539	$13 990	$15 606	$17 397
GDP/Capita (2016 $)	$7 457	$7 430	$8 128	$8 633	$9 308	$9 546	$9 818	$10 411	$11 072	$11 793	$12 558	$13 365
Pop. Growth, percent	1.0%	1.7%	1.7%	2.4%	1.6%	1.7%	1.7%	1.6%	1.4%	1.3%	1.2%	1.1%
Real Growth, percent	6.3%	-1.5%	5.3%	4.7%	5.0%	4.3%	4.6%	4.6%	4.6%	4.5%	4.4%	4.3%
GDP Deflator, percent	2.0%	0.6%	3.2%	2.1%	2.1%	2.1%	3.0%	2.5%	2.3%	2.3%	2.3%	2.3%
Change in real per capita GDP, percent	5.2%	-3.2%	3.6%	2.3%	3.4%	2.6%	2.9%	3.0%	3.1%	3.2%	3.2%	3.2%
Exchange Rate (Ringgit per US $)	3.4	3.5	3.1	3.2	3.9	4.1	4.0	3.9	3.9	3.9	3.9	3.9

Source: IMF Statistics, October 2016

4.1.2 Overview of Petrochemical Industry

Lotte Chemical Titan Holding Sdn Berhad ("Lotte Chemical Titan") and PETRONAS Chemicals Group Berhad ("PCG") are the two major petrochemicals producers in the Malaysian petrochemical industry. Lotte Chemical Titan primarily focuses on olefins and polyolefins production via an integrated naphtha

[2]IMF Statistics, October 2016

based cracker facility which also produces butadiene, benzene, toluene and TBA. PCG produces a wide range of petrochemical products including olefins and polyolefins as well as methanol, ammonia, urea, aromatics and other derivatives. Both companies have a strong domestic position but also export significant volumes to other countries such as Indonesia and China.

PETRONAS is in the process of developing the Refinery and Petrochemical Integrated Development (RAPID) project, located in the state of Johor, Malaysia. RAPID is currently constructing a world-scale integrated refinery and petrochemical complex to meet the growing needs for both commodity and specialty chemicals in Asia. RAPID will contain a 300 000 barrel-per-day oil refinery and a petrochemical complex with a production capacity of 7.7 million tons. The project will also see the development of associated facilities such as raw water supply facility, power co-generation plant, LNG regasification terminal, and other ancillary facilities. In February 2017, Saudi Arabia's state oil company Saudi Aramco made a decision to invest US$7 billion in the RAPID project.

In 2016, Malaysia accounted for approximately 2.8 million tons per year of olefins capacity in the region, 14 percent of the total olefins capacity in SEA. The majority of olefins production is consumed domestically for the production of polyolefins and other key intermediates of ethylene such as ethylene glycol, acrylic acid and styrene.

Within the polyolefins' sector, Malaysia is a net exporter of low density polyethylene ("LDPE") but is reliant on imports for high density polyethylene ("HDPE"), linear low density polyethylene ("LLDPE") and polypropylene (PP).

Table 4.2 Overview of Malaysian Petrochemical Industry

Products	Capacity 2016 (Thousand Tons)	Demand 2016 (Thousand Tons)	Net Export 2016 (Thousand Tons)	Demand Growth CAGR (2007-2016)	Demand Growth CAGR (2017-2027)F
Ethylene	1741	1394	207	0.1	4.8
Propylene	1089	628	8	-1.8	11.1
Butadiene	100	217	-138	19.1	7.0
Polyethylene	1070	1205	-247	9.0	11.9
HDPE	515	550	-88	0.4	3.8
LLDPE	70	477	-432	4.4	4.4
LDPE	485	178	273	4.2	3.7
Polypropylene	440	514	-129	3.7	3.2
Benzene	285	195	44	0.0	6.6

Note: negative figure for net export means there is a net import of product

4.1.3 Malaysian Olefins Supply, Demand and Trade

Nexant forecasts high demand growth of ethylene and propylene, with a CAGR of approximately 4.8 percent and 11.1 percent respectively, over the forecast period 2017-2027. The expected demand growth is supported particularly by investment on downstream derivatives within the value chain within the country.

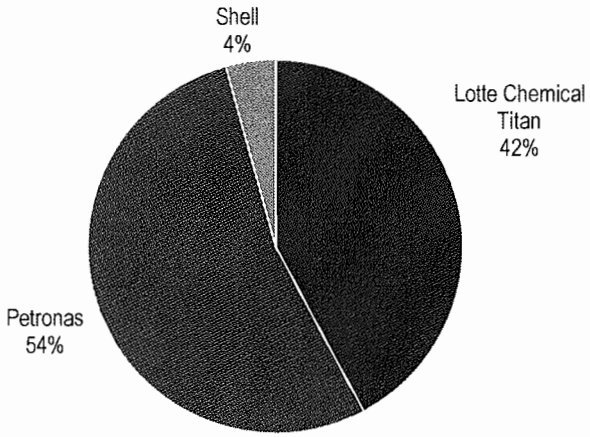
Total olefins capacity is approximately 3 million tons in Malaysia in 2016. The market is supplied by three companies; Lotte Chemical Titan, PCG and Shell Chemicals. Lotte Chemical Titan is a major domestic olefins producer with an estimated market share of 42 percent in 2016. In recent years, the company has grown its olefins capacity in the domestic market, with an increase in domestic propylene capacity of close to 7 percent between 2007-2011. The company also has relatively high levels of forward

integration predominantly into polyolefins. Lotte Chemical Titan plans to expand its olefins capacity by 92 000 tons per year of ethylene and 170 000 tons per year of propylene in the second of 2017.

PCG has the largest capacity share with over half of the domestic olefins market. Most of olefins produced by PCG are consumed onsite to produce polyolefins and key intermediates such as glycols and acrylic acid. Shell Chemicals is also active in propylene production, via refinery integration. However, its overall capacity is relatively small.

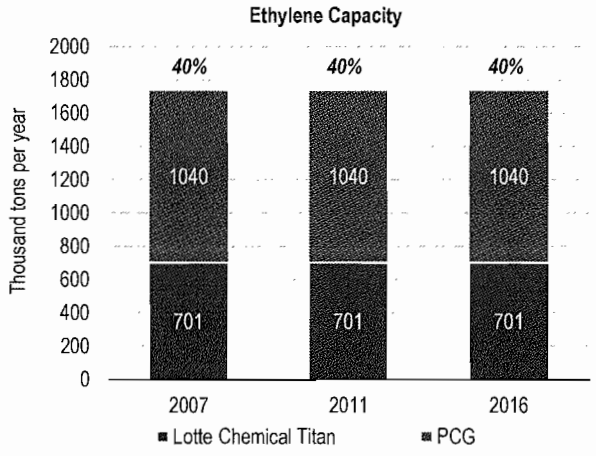
The RAPID will include around 2 million tons per year of olefins capacity as well as its downstream derivatives in the value chain of ethylene and propylene, with expected production in 2020.

Figure 4.1 Olefins Capacity Share
(Ethylene and Propylene, 2016)

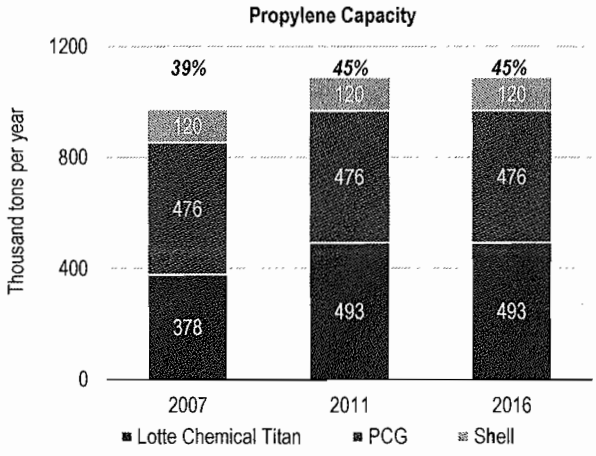


Source: Nexant **Total Supply = 3 Million tons**

Figure 4.2 Overview of Malaysian Olefins Firm Production Capacity
(2007, 2011 and 2016)



Note: *x%* = Lotte Chemical Titan Share Source: Nexant

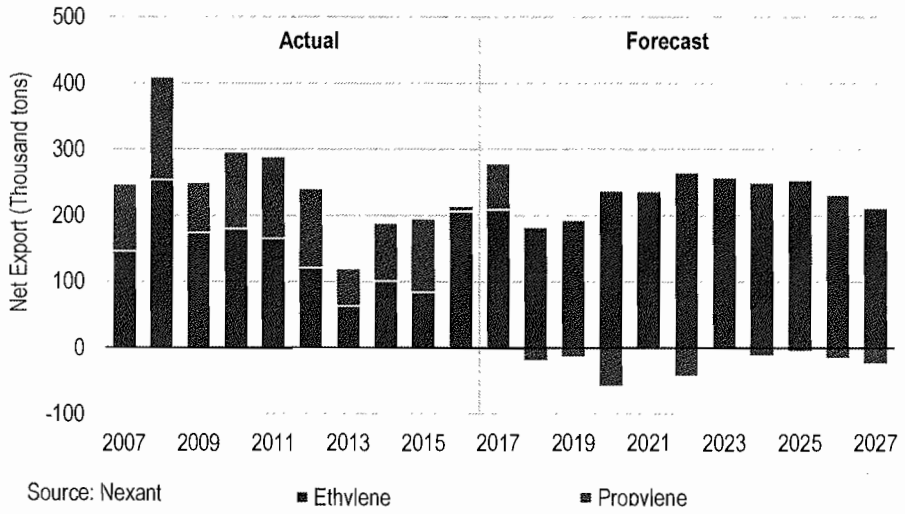


Note: *x%* = Lotte Chemical Titan Share Source: Nexant

Total imports of olefins were estimated at over 215 000 tons in 2016. Malaysia is a sizeable exporter of ethylene within the Asian region. The majority of exports are sold into neighbouring Indonesia but also to China. Malaysia is also a net exporter of propylene with most volumes of propylene being exported to

neighbouring Indonesia. Upon Lotte Chemical Titan's capacity expansion plans, 170 000 tons per year of propylene will be added in the second half of 2017.

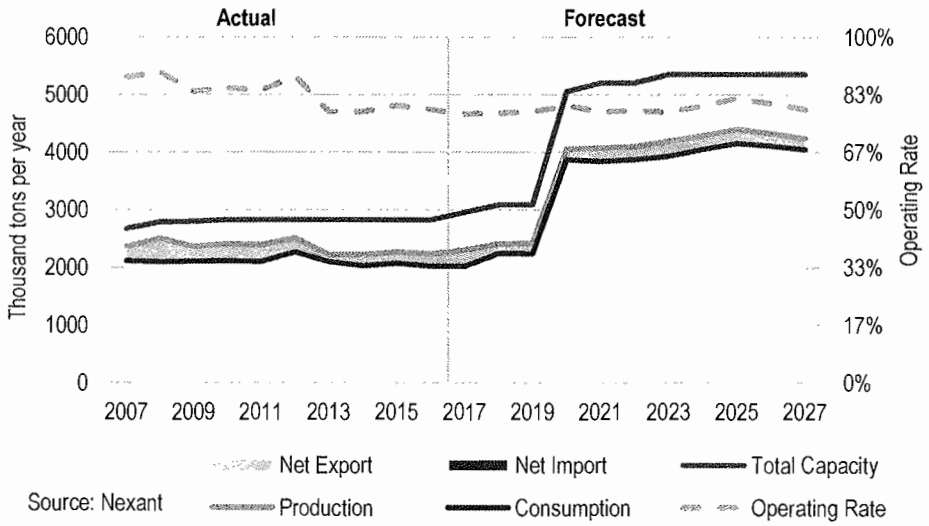
Figure 4.3 Overview of Domestic Olefins Net Trade



Source: Nexant

Olefins consumption in Malaysia is estimated at around 2 million tons in 2016 and it is expected to have an annual demand growth of around 7.2 percent in 2017-2027. With the expected start-up of the RAPID project, Malaysia is forecast to maintain its supply surplus of olefins over the forecast period unless further downstream derivatives capacity is added after completion of RAPID. Olefins production is expected to increase in 2020 due to this project, which will be mainly captively consumed for the project's other downstream derivative plants, resulting in an increase in consumption of olefins at the same time.

Figure 4.4 Olefins Supply, Demand and Trade – Malaysia



Source: Nexant

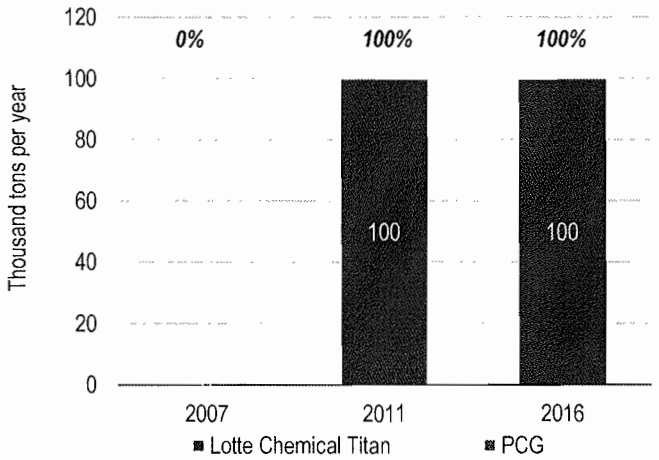
4.1.4 Malaysian Butadiene Supply, Demand and Trade

The primary demand driver for butadiene in Malaysia in recent years has been the development of NBR latex production. Malaysia is the world's largest supplier of natural rubber and NBR gloves with a market share of 60 percent of the global glove demand. The expected demand growth is supported particularly by investment on downstream derivatives of synthetic rubber within the country. The first butadiene rubber plant was commissioned in Malaysia at the end of 2015, which has the capacity to consume

50 000 tons per year of butadiene. ABS, another downstream derivative of butadiene, is a small but expanding contributor to butadiene consumption in Malaysia.

Lotte Chemical Titan is currently the sole butadiene producer in Malaysia, with its 100 000 tons per year butadiene plant operating since 2008. The RAPID project is planned to include a 192 000 tons per year butadiene unit, which is scheduled to commence production in around 2020.

Figure 4.5 Overview of Malaysian Butadiene Firm Production Capacity *(2007, 2011 and 2016)*

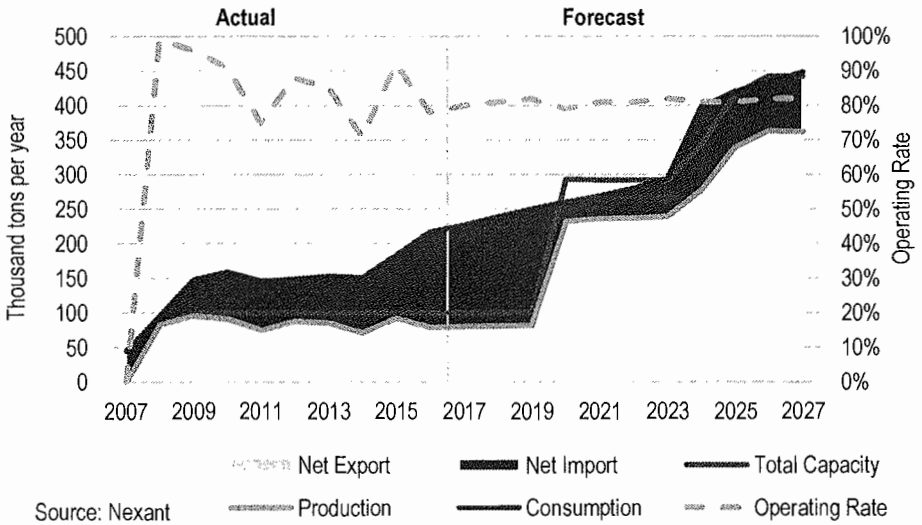


Note: ***x%*** = Lotte Chemical Titan Share Source: Nexant

In 2016, Malaysia consumed around 217 000 tons per year of butadiene. It is anticipated that butadiene consumption into NBR latex continues to be the driver of growth. Nexant forecasts high demand growth of butadiene at a CAGR of approximately 7 percent over the forecast period 2017-2027.

On this basis, Malaysia will to continue to require imports of butadiene to satisfy domestic demand, despite the addition of butadiene capacity from the RAPID project. Major suppliers of butadiene into Malaysia include Singapore, Thailand, Saudi Arabia and India.

Figure 4.6 Butadiene Supply, Demand and Trade – Malaysia



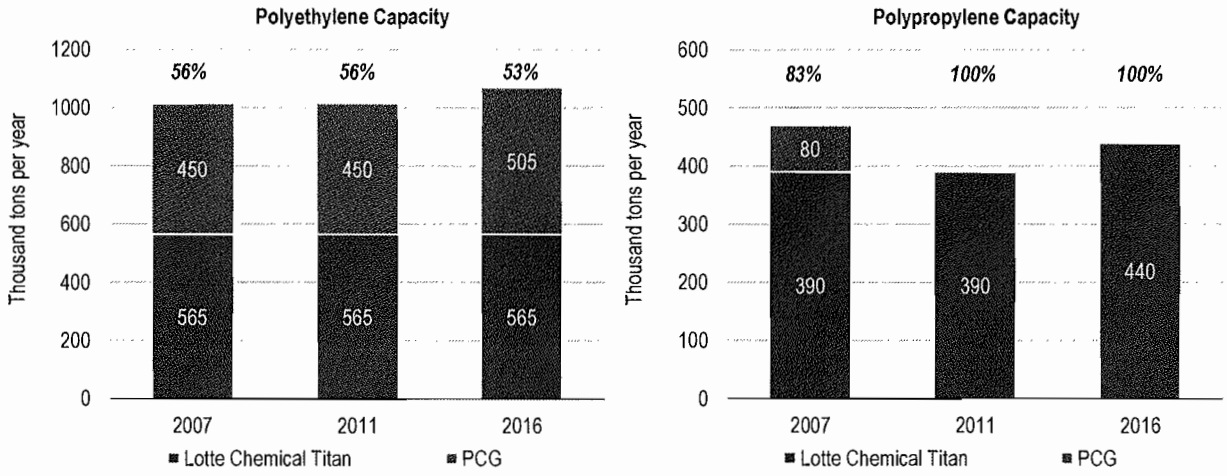
Source: Nexant

4.1.5 Malaysian Polyolefins Supply, Demand and Trade

Malaysia consumes plastics across a variety of different products including; packaging, electrical/electronics, household products, construction materials and automotive components, where there is significant manufacturing in these respective sectors in Malaysia resulting in high demand of polyolefins in the country. The Malaysian economy will be the driver of demand of petrochemicals, providing opportunities for the local producers.

Malaysia has two producers of polyolefins, Lotte Chemical Titan and PCG. Lotte Chemical Titan currently has the largest capacity share estimated at approximately 67 percent. The company had increased its domestic polypropylene capacity by 2.4 percent over 2011 to 2016. Furthermore, Lotte Chemical Titan plans to expand its polypropylene capacity by 200 000 tons per year in 2018. PCG grew its domestic polyethylene capacity share by 2.3 percent over 2011-2016, and with the RAPID project is planned to include around 1.6 million tons of polyolefins units. The project is scheduled to commence production in around 2020.

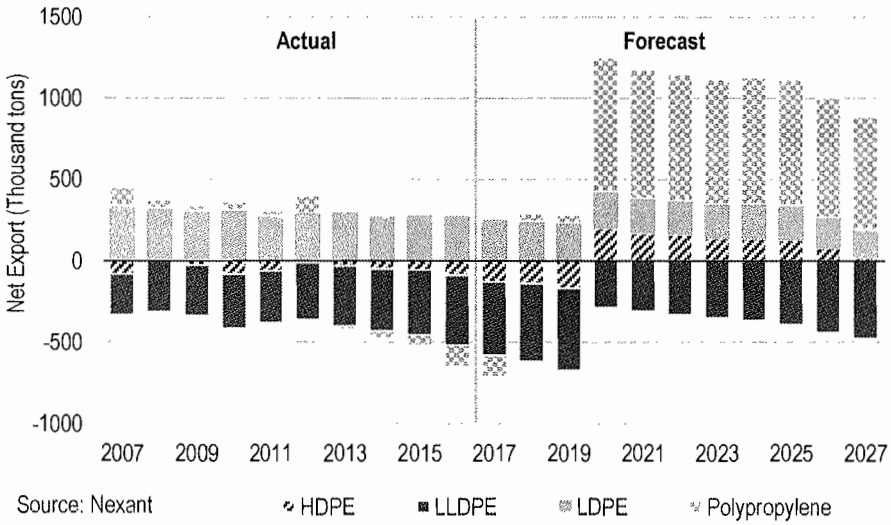
Figure 4.7 Overview of Malaysian Polyolefins Firm Production Capacity
(2007, 2011 and 2016)



Note: x% = Lotte Chemical Titan Share Source: Nexant

Note: x% = Lotte Chemical Titan Share Source: Nexant

Figure 4.8 Overview of Domestic Polyolefins Net Trade



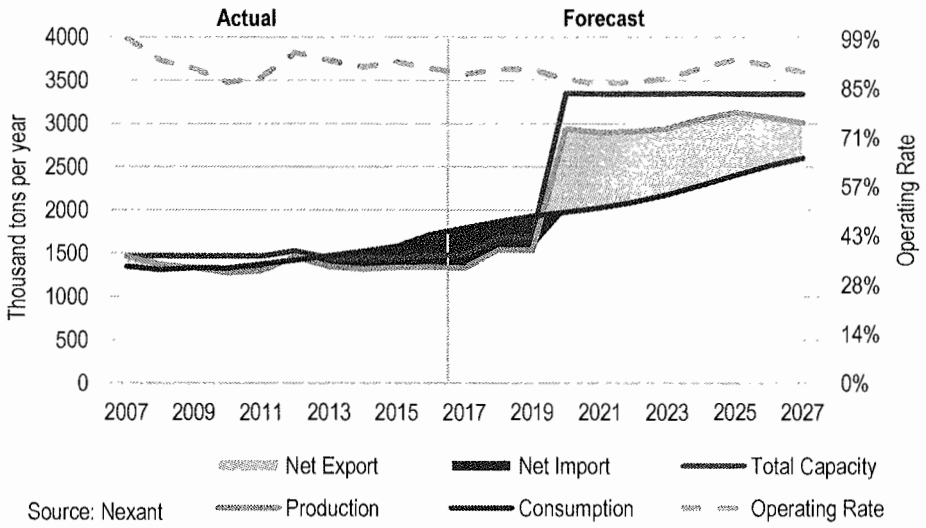
Source: Nexant

Competition in the domestic market comprises both domestic players as well as imports from various SEA producers including those in Thailand and Singapore, and Middle Eastern sources.

Malaysia is currently a net exporter of LDPE at around 273 000 tons in 2016 while it is a net importer of HDPE, LLDPE and polypropylene. Total net imports of these three products including HDPE, LLDPE and polypropylene was nearly 650 000 tons in 2016. These net imports represent 22 percent of the total domestic market. The majority of imports originate from Singapore, Thailand and the Middle East. Nexant forecasts Malaysia to remain structurally deficient in many polymers until the start-up of the RAPID project in 2020, where the country will become a net exporter of polyolefins, due to the capacity additions from the project.

Malaysia consumed approximately 1.7 million tons of polyolefins in 2016 with the majority of this material produced from domestic sources. Malaysian polyolefin demand is forecast to grow at a 3.8 percent CAGR over the period of 2017-2027.

Figure 4.9 Polyolefins Supply, Demand and Trade – Malaysia



Source: Nexant

4.1.6 Malaysian Benzene Supply, Demand and Trade

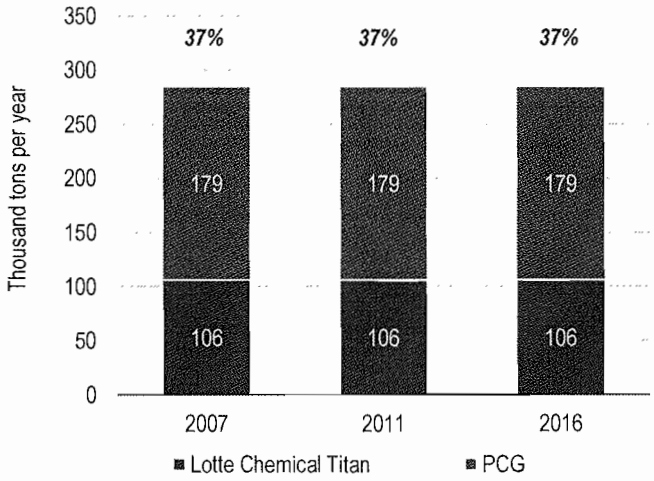
Benzene consumption in Malaysia was 195 000 tons in 2016. The majority of this consumption is in the production of styrene in the country, with Idemitsu SM (a 70:30 joint venture between Idemitsu Kosan and Petronas) the only styrene producer in the country with production capacity of 240 000 tons per year in Pasir Gudang.

The future growth in benzene demand is expected to come as part of the RAPID project. The project will include benzene downstream derivative products such as cumene, phenol and bisphenol-A.

There are currently two benzene producers in Malaysia; Lotte Chemical Titan who produces benzene from pygas extraction and Aromatics Malaysia (PETRONAS) which produces benzene from its reformate-based aromatic complex. Lotte Chemical Titan is planning to debottleneck its cracker in Pasir Gudang in the second half of 2017 and this is expected to increase benzene capacity by 134 000 tons per year.

The RAPID project will include a 300 000 tons per year benzene unit. The project is scheduled to commence production in around 2020.

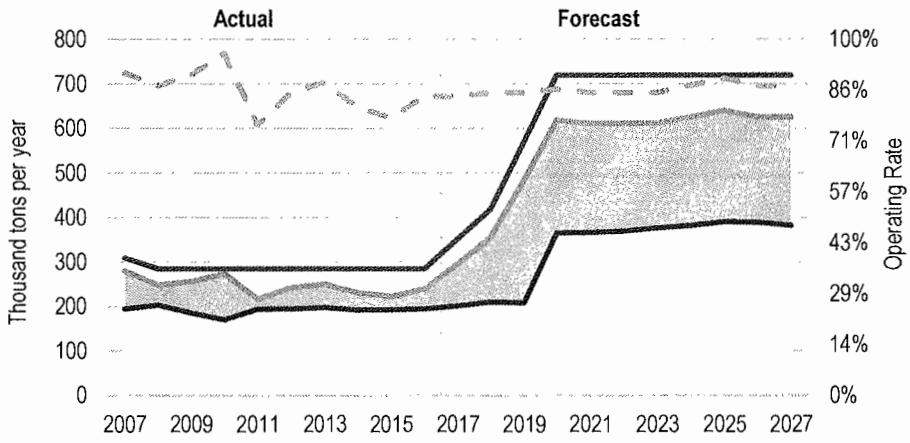
Figure 4.10 Overview of Malaysian Benzene Firm Production Capacity
(2007, 2011 and 2016)



Note: *x%* = Lotte Chemical Titan Share Source: Nexant

Nexant forecasts a demand growth of benzene at a CAGR of 6.6 percent over the forecast period 2017-2027. Malaysia is a net exporter of benzene with annual exports of around 50 000 tons per annum. The surplus benzene production is exported mainly to Singapore, China, and Indonesia. The export volumes are forecast to increase with regards to the capacity expansion of Lotte Chemical Titan in 2017 and the start-up of RAPID project expected in 2020.

Figure 4.11 Benzene Supply, Demand and Trade – Malaysia



Source: Nexant

4.1.7 Regulatory Framework

Prior to 1974, the oil and gas industry in Malaysia was governed by the Petroleum Mining Act 1966 (Act 95), under which, it adopted the concessions system for activities in this industry. Concessionaires who were mainly multinational corporations (MNCs) enjoyed exclusive rights to explore and produce resources in return for payment of royalty and taxes to the government. Recognising the importance of having national control over the oil and gas industry, the Malaysian Government enacted the Petroleum

Development Act in 1974, and established its national oil company, PETRONAS. The Act came into force on 1 October 1974.

The Petroleum Development Act 1974 regulates the petroleum and petrochemicals industries in Malaysia. PETRONAS is authorised to regulate all activities in the upstream sector (oil & gas), while the downstream sector (refining and petrochemicals) is regulated by the Ministry of Domestic Trade, Co-Operatives and Consumerism (MDTCC) and the Ministry of International Trade and Industry (MITI). MITI is responsible for the issuance of permits for the refining of crude petroleum, the processing of natural gas and the manufacture of petroleum products and petrochemical products. MDTCC issues license for the marking and distribution of petroleum and petrochemical products.

Regulations associated to the petrochemical industries are intended to protect and improve health, safety and environment of related activities. Regulations cover every step of a chemical products life cycle, from the manufacturing process through to its final disposal. Relevant regulations governing the petrochemical industry for processing, storage, transportation, marketing and trading include:

- Federal Regulation:
  - Petroleum Development Act 1974 (Act 144)
  - Petroleum (Safety Measures) Act 1984
  - Industrial Co-ordination Act 1975 (Act 156)
  - Environmental Quality Act 1974 (Act 127)
  - Occupational Safety and Health Act 1993 (Act 514)

Petrochemical manufacturers have to obtain a Certificate of Fitness (CF) for their machinery and plants from Department of Occupational Safety and Health (DOSH) under the Ministry of Human Resources (MOHR).

Nexant does not expect any significant changes to the current regulatory framework associated with the downstream and petrochemical industries in Malaysia in the immediate future. The Malaysian government and key industrial players (i.e. PETRONAS) are expected to continue their efforts in attracting investors into the country.

4.2 INDONESIA

4.2.1 Economic Overview

Indonesian GDP growth has averaged 4.9 percent per year in the past 3 years (2014-2016). The oil and gas sector contributes about 20 percent of the country's revenues. Joko Widodo, the newly elected Indonesian president who assumed his office on October 20, 2014, has set out ambitious development goals, focusing on improvement of energy and other infrastructure, strengthening governance in key sectors as well as more effective policy formulation and implementation. In order to continue driving economic expansion, the government is keen to expand the manufacturing and industry sectors by pledging to introduce tax incentives and measures aimed at attracting capital inflows, including lower energy tariffs for labour-intensive industries such as petrochemicals, ceramics, and glass. The government has increased infrastructure funding and unveiled policy reforms to stimulate private investment, which includes lower interest rates, that has helped improve GDP growth by 0.1 percent in 2016 over 2015.

In the longer term, Indonesia's outlook remains positive and is assumed by Nexant to continue leading consumption growth in SEA based on forecast GDP growth (see Table 4.3). The country has put into place an economic planning regime that follows a 20-year development plan, spanning from 2005 to 2025. It is segmented into 5-year medium-term plans, each with different development priorities. The current medium-term development plan, which is currently in the third phase, runs from 2015 to 2020, focusing, among others, on infrastructure development and improving social assistance programs in education and health-care. Such shifts in public spending have been enabled by a reform of long-standing energy subsidies, allowing for more investment in programs to aid low income earners. In view of plans[3] that have been put in place by the government, the manufacturing sector is likely to continue to grow, driving polyolefin demand in Indonesia.

Table 4.3 Profile of Macroeconomic Factors for Indonesia

	Actual						Forecast					
Indonesia	**2007**	**2009**	**2011**	**2013**	**2015**	**2016**	**2017**	**2019**	**2021**	**2023**	**2025**	**2027**
Population, million	228	234	242	249	255	259	262	269	275	280	285	290
GDP, million current US $	504466	574658	852762	887726	858951	940953	1031963	1212175	1412202	1640007	1898829	2192170
GDP, million 2016 $	572960	644545	727959	814747	896701	940953	990824	1097042	1210573	1331608	1460336	1596899
GDP deflator Index (2016 = 100)	60.3	69.6	77.0	85.2	96.5	100.0	104.2	110.5	116.7	123.2	130.0	137.3
GDP Real Growth Index (2016 = 100)	60.9	68.5	77.4	86.6	95.3	100.0	105.3	116.6	128.7	141.5	155.2	169.7
Economic Measures												
GDP/Capita (Current $)	$2 215	$2 453	$3 524	$3 568	$3 362	$3 636	$3 936	$4 512	$5 144	$5 855	$6 656	$7 557
GDP/Capita (2016 $)	$2 516	$2 751	$3 008	$3 274	$3 510	$3 636	$3 779	$4 083	$4 409	$4 754	$5 119	$5 505
Pop. Growth, percent	1.4%	1.4%	1.8%	1.4%	1.3%	1.3%	1.3%	1.2%	1.1%	1.0%	0.9%	0.8%
Real Growth, percent	6.3%	4.7%	6.2%	5.6%	4.8%	4.9%	5.3%	5.2%	5.0%	4.8%	4.7%	4.5%
GDP Deflator, percent	6.7%	5.0%	5.3%	6.4%	6.4%	3.7%	4.2%	3.0%	2.8%	2.8%	2.8%	2.8%
Change in real per capita GDP, percent	4.8%	3.2%	4.3%	4.1%	3.4%	3.6%	3.9%	3.9%	3.9%	3.8%	3.7%	3.7%
Exchange Rate (Rupiah per US $)	9 140	10 409	8 774	10 438	13 436	13 341	13 534	13 874	14 048	14 224	14 403	14 583

Source: IMF Statistics, October 2016

4.2.2 Overview of Petrochemical Industry

The petrochemicals industry continues to play an important role in Indonesia's fast growing economy. Initially domestic industry developments were primarily focused in methanol, ammonia and agricultural sectors. Investment in these sectors has been facilitated by domestic availability of natural gas. However, over the last decade, the Indonesian petrochemical sector has developed further and has

[3]Based on plans in Industry Facts and Figures 2015 (Ministry of Industry Republic of Indonesia)

expanded into olefins and olefin downstream derivatives production including polyolefins. These products are being consumed locally for packaging, construction and the wider manufacturing sectors.

Government stimulus packages designed to improve basic infrastructure are also further driving domestic demand for chemicals, primarily for construction materials. With a significant population around 262 million and a significant potential for material substitution with plastics, potential demand growth of basic chemicals and polymers remains positive over the medium and long term. The consumption per capita is low compared to other Asian countries but is forecast to increase.

Indonesia is dependent on imports from other countries to satisfy its consumption of petrochemicals. Total imports of polyolefins in 2016 are estimated at over 1.5 million tons, with the majority of these imports coming from neighbouring Malaysia, Thailand and Singapore. Total polyolefin imports are set to remain at around one to two million tons per annum in the long term.

Lotte Chemical Titan and Pertamina (state owned company) have plans to expand the petrochemical capacity in Indonesia, although the timeline for this is not certain and hence Nexant assumes some additional speculative capacity of polyolefins may be built by 2022-2023 which would result in a reduction in total net imports.

Table 4.4 Overview of Indonesian Petrochemical Industry

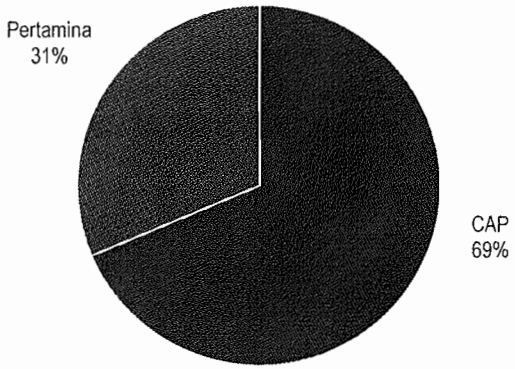
Products	Capacity 2016 (Thousand Tons)	Demand 2016 (Thousand Tons)	Net Export 2016 (Thousand Tons)	Demand Growth CAGR (2007-2016)	Demand Growth CAGR (2017-2027)F
Ethylene	860	1384	-619	3.6	10.3
Propylene	1078	811	-8	2.3	12.1
Butadiene	100	64	6	1.3	14.0
Polyethylene	790	1317	-653	18.4	14.0
HDPE	390	607	-249	6.1	4.7
LLDPE	400	510	-204	7.4	5.0
LDPE	0	200	-200	4.9	4.3
Polypropylene	765	1513	-860	6.4	5.0
Benzene	525	282	-161	3.4	2.3

Note: negative figure for net export means there is a net import of product

4.2.3 Indonesian Olefins Supply, Demand and Trade

In 2016, total olefins (ethylene and, propylene) capacity in Indonesia was approximately 1.9 million tons. Chandra Asri Petrochemical (CAP) holds a majority of domestic capacity with an estimated share of 69 percent of the domestic olefins market in 2016. CAP is the sole domestic producer of ethylene with a current ethylene capacity of 860 000 tons per year. CAP also has 470 000 tons per year of propylene as a by-product from its steam cracker.

Figure 4.12 Olefins Capacity Share
(Ethylene and Propylene, 2016)

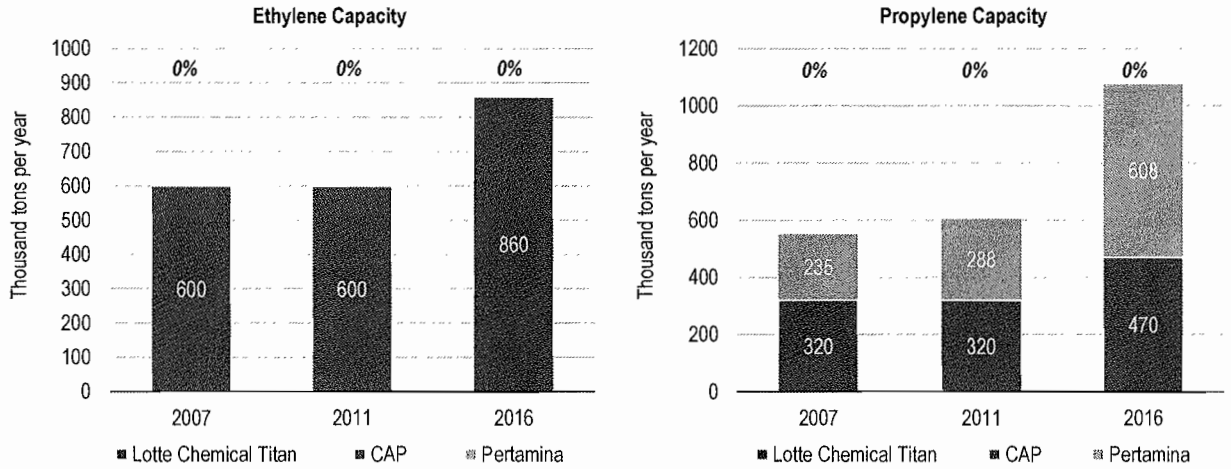


Source: Nexant **Total = 1.9 Million tons**

CAP has very recently announced that it intends to undertake a feasibility study for a new 1 million tons per year ethylene cracker complex with its strategic partner SCG Chemicals Co. Ltd although no timeline has been specified regarding this project.

Pertamina has a total propylene capacity of around 608 000 tons per year at present which is integrated with its refineries. Lotte Chemical Titan has indicated plans to add a new ethylene cracker with an estimated capacity of one million tons per year by 2022.

Figure 4.13 Overview of Indonesian Olefins Firm Production Capacity
(2007, 2011 and 2016)

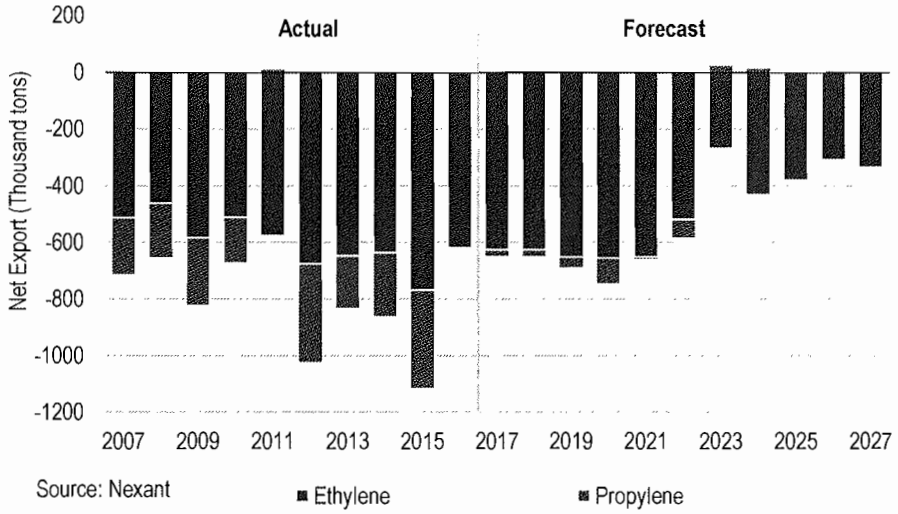


Note: *x%* = Lotte Chemical Titan Share Source: Nexant

Note: *x%* = Lotte Chemical Titan Share Source: Nexant

Indonesia is Asia's second largest importer of olefins. Total imports of olefins is estimated at over 600 000 tons in 2016. The majority of these imports are supplied from neighbouring Malaysia, Thailand and Singapore, as well as from Saudi Arabia. Indonesia is forecast to continue to rely on imports which may reduce in quantity, subject to the plans of Lotte Chemical Titan and Pertimina.

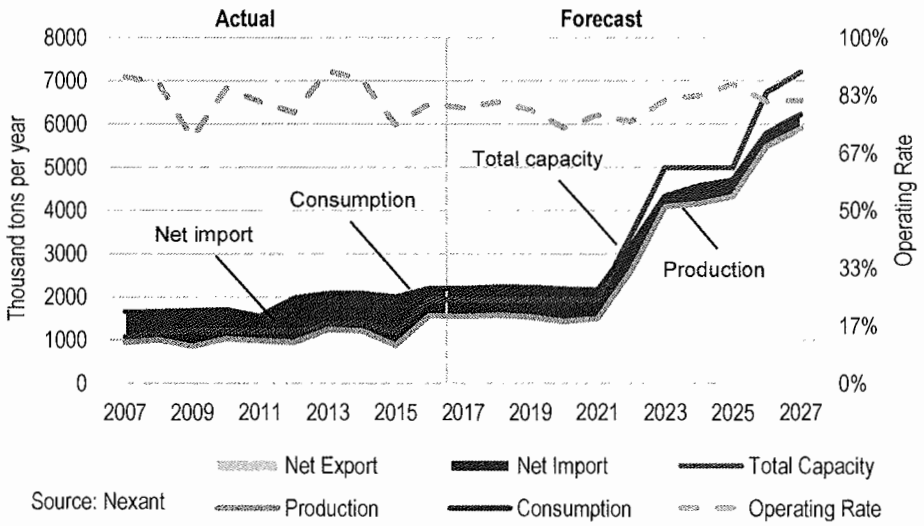
Figure 4.14 Overview of Domestic Olefins Net Trade



Source: Nexant

Nexant forecasts high demand growth of olefins at a CAGR of approximately 11 percent over the forecast period 2017-2027. The expected demand growth is supported by integrated investment with downstream derivatives products such as HDPE and LLDPE within the country as well as mainly polypropylene and acrylic acid production for propylene demand. Increased olefins capacity will be captively consumed as feedstock for downstream derivative plants, resulting in an increase in consumption of olefins at the same time as capacity addition.

Figure 4.15 Olefins Supply, Demand and Trade – Indonesia



Source: Nexant

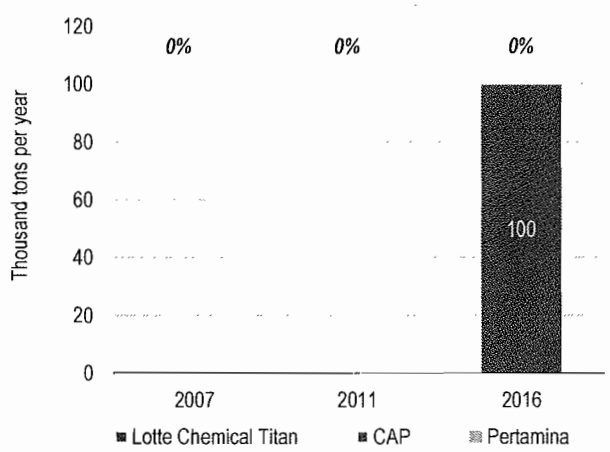
4.2.4 Indonesian Butadiene Supply, Demand and Trade

Demand for butadiene in Indonesia is expected to grow at 14 percent per year over the period of 2017-2027. This growth estimate is supported by expansions of existing domestic butadiene derivative product capacity. These include a 60 000 tons per year PBR capacity and a 60 000 tons per year SBR capacity by 2018 by Synthetic Rubber Indonesia (SRI), as well as some expected capacity expansions.

PT Petrokimia Butadiene – a subsidiary of Chandra Asri Petrochemical (CAP), the operator of Indonesia's cracker complex – commissioned the country's first butadiene plant of 100 000 tons per year

in late 2013. No other butadiene capacity additions have been announced although it is possible that further developments could occur, integrated with any further ethylene cracker capacity additions.

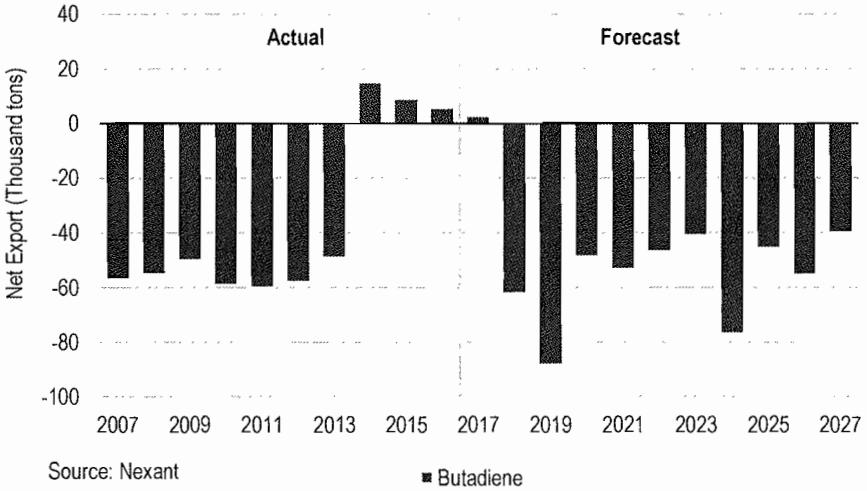
Figure 4.16 Overview of Indonesian Butadiene Firm Production Capacity
(2007, 2011 and 2016)



Note: *x%* = Lotte Chemical Titan Share Source: Nexant

Prior to 2013, butadiene demand in Indonesia was solely met by imports. With the recent start-up of CAP's 100 000 tons per year production capacity in late 2013, Indonesia became a small net exporter of butadiene with the surplus amount supplied to China and South Korea. Indonesia is forecast to return to a net import position due to demand growth outpacing supply growth.

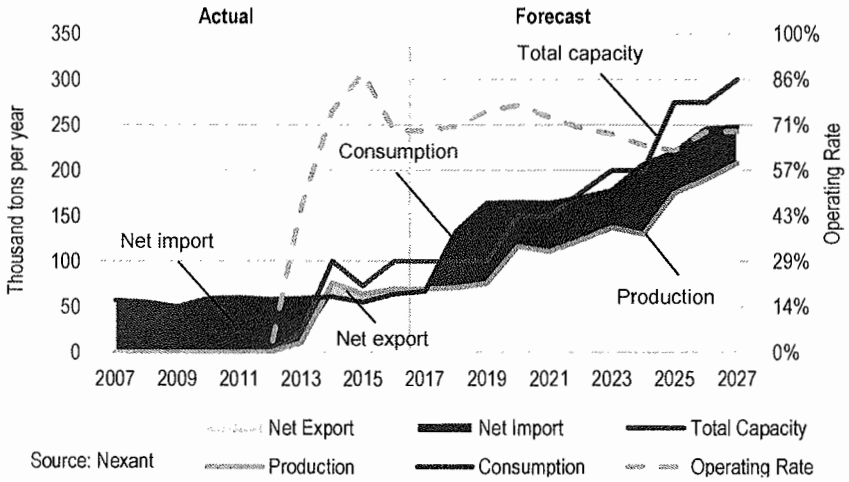
Figure 4.17 Overview of Domestic Butadiene Net Trade



Source: Nexant

In 2016, Indonesia consumed around 64 000 tons per year of butadiene of which BR and SBR are key derivatives. Nexant forecasts demand growth of butadiene at a CAGR over 14 percent over the period of 2017-2027 as a result of envisaged BR and SBR capacity additions resulting from demand from the Indonesian automotive industry. This underpins butadiene demand growth over the forecast period while butadiene supply is expected to be insufficient. CAP is currently investigating to expand its current 100 000 tons per year butadiene plant, but no definite implementation plans have been announced resulting in lower supply growth relative to demand and a resultant increase in imported butadiene needs.

Figure 4.18 Butadiene Supply, Demand and Trade – Indonesia



Source: Nexant

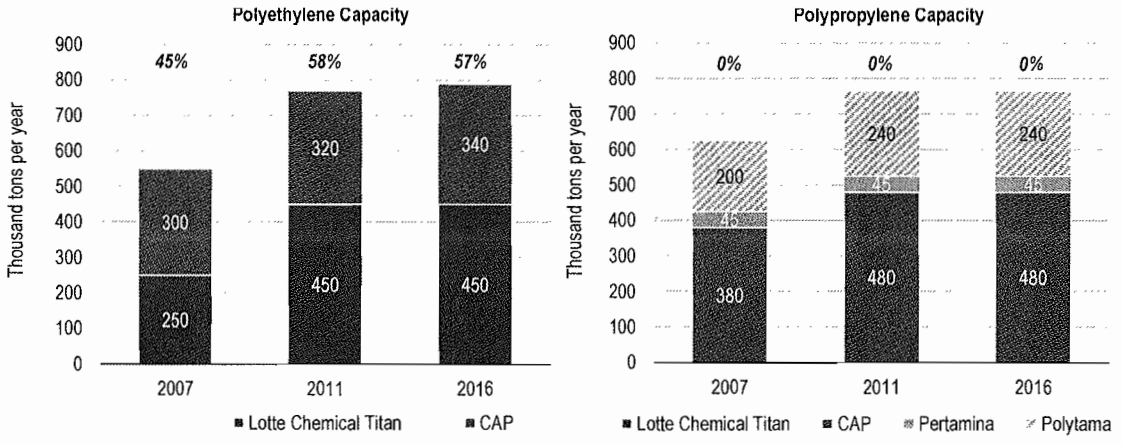
4.2.5 Indonesian Polyolefins Supply, Demand and Trade

Indonesia has four producers of polyolefins; Chandra Asri Petrochemical (CAP), Lotte Chemical Titan, Pertamina and Polytama. Lotte Chemical Titan has a 29 percent capacity share of the total Indonesian polyolefins capacity. The company owns HDPE and LLDPE capacity totalling 450 000 tons per year.

Lotte Chemical Titan has indicated plans to add a new ethylene cracker with an estimated capacity of one million tons per year by 2022 with the intention of including an additional one million tons per year of polyethylene and 400 000 tons per year of polypropylene capacities.

CAP has the largest share of polyolefin capacity in Indonesia, total 820 000 tons per year in 2016 (54 percent). There are potential plans to build a new LLDPE plant with a capacity of 400 000 tons per year, as part of an announced study for a 1 million ton ethylene cracker complex. This is not firm and Nexant views this as a speculative amount in its analysis.

Figure 4.19 Overview of Indonesian Polyolefins Firm Production Capacity
(2007, 2011 and 2016)



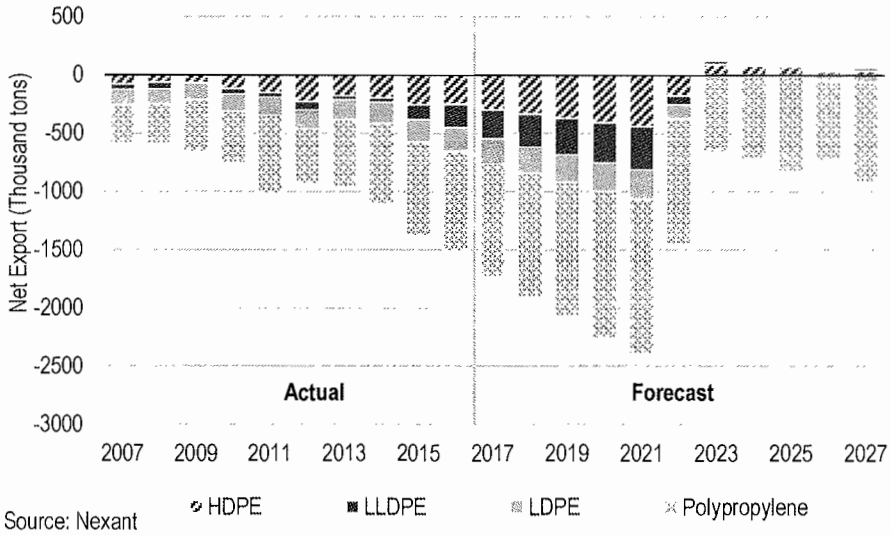
Note: *x%* = Lotte Chemical Titan Share Source: Nexant

Note: *x%* = Lotte Chemical Titan Share Source: Nexant

Indonesia is a net importer of polyethylene and polypropylene. In 2016, total net imports of polyethylene and polypropylene were approximately 653 000 and 860 000 tons respectively and account for 53 percent of the total domestic polyolefin market demand. The majority of these imports originate from

Malaysia, Singapore, Thailand and the Middle East. Overall, Nexant forecasts Indonesia to remain as a major net importer of polyolefins over the period 2017-2027. A reduction in polyolefin net imports is contingent on successfully completion of potential future planned projects.

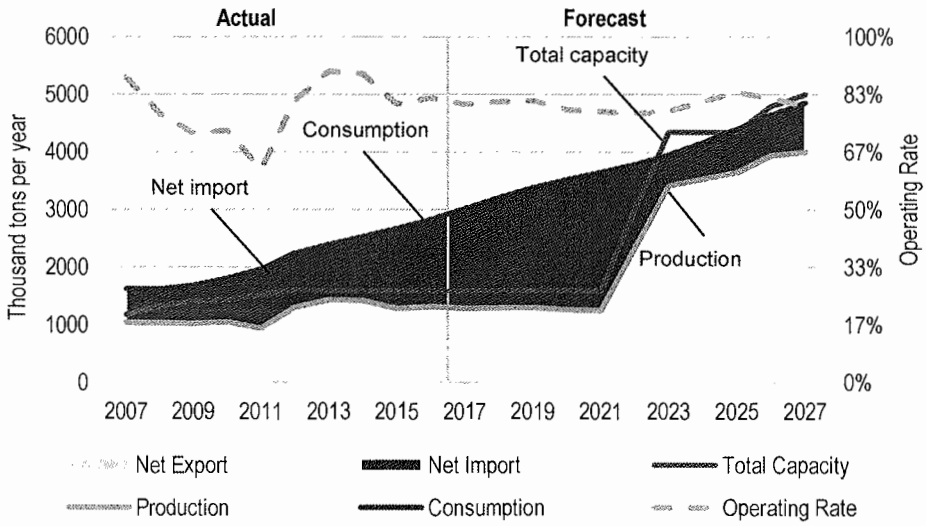
Figure 4.20 Overview of Domestic Polyolefins Net Trade



Source: Nexant

Indonesia consumed approximately 2.8 million tons of polyolefins in 2016 and Nexant forecasts demand growth at 4.9 percent CAGR over the period 2017-2027, which is aligned with Indonesia's GDP forecast growth. There is currently no firm capacity additions expected over the forecast period. However, Nexant estimates some additional speculative capacity of polyolefins to be built by 2022-2023 which would result in a reduction in total net imports, based on possible plans of Lotte Chemical Titan and Pertamina, which is factored in the supply, demand and trade outlook.

Figure 4.21 Polyolefins Supply, Demand and Trade – Indonesia

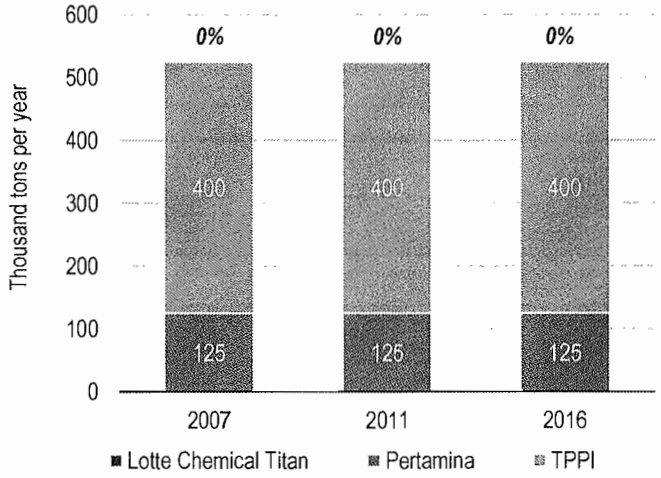


4.2.6 Indonesian Benzene Supply, Demand and Trade

Pertamina and TPPI are the only benzene producers in Indonesia. Total imports of benzene were estimated at over 161 000 tons in 2016. The majority of these imports are sourced from neighbouring Malaysia, Thailand and Singapore. The net trade position of Indonesia depends largely on the operation

of TPPI, which has had operational issue. It is assumed to commence normal operations in 2017, which may result in the country having a small net export of benzene in the short term.

Figure 4.22 Overview of Indonesian Benzene Production Capacity
(2007, 2011 and 2016)

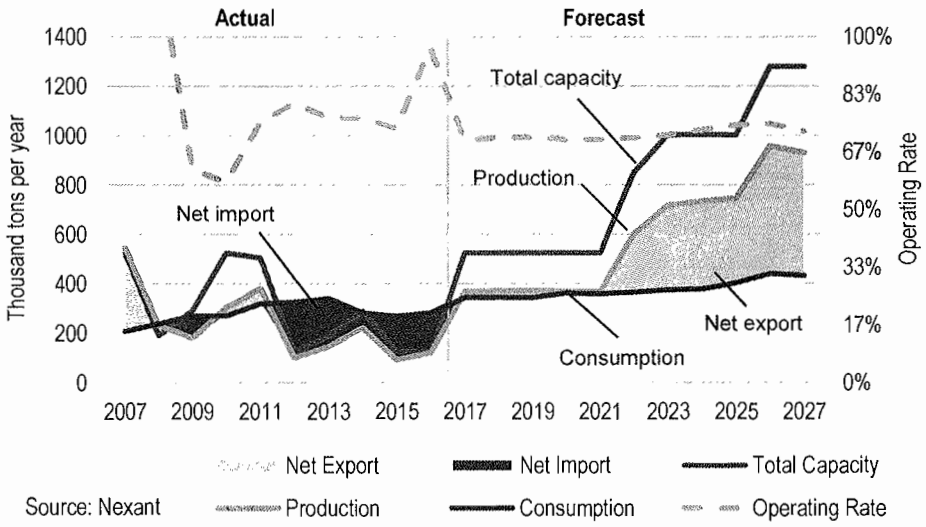


Note: *x%* = Lotte Chemical Titan Share Source: Nexant

Nexant estimates some additional speculative capacity of benzene to be built by 2022-2023 which would result in an increase in total net exports. In the longer term, the export quantity is expected to increase as a result of benzene capacity development associated with the potential development of a future cracker complex in 2022-2023. Indonesia would have a net export position, as capacity would exceed domestic consumption needs.

Benzene consumption in Indonesia was 282 000 tons in 2016. Drivers of consumption are due to consumption by downstream derivative products such as styrene and LAB. Demand is estimated to grow at an average of 2.3 percent per year over the period of 2017-2027.

Figure 4.23 Benzene Supply, Demand and Trade – Indonesia



Source: Nexant

4.2.7 Regulatory Frameworks

Indonesia has underlined the oil, gas and coal based chemical industry as one of the ten priority industry groups to be developed under the Master Plan of National Industry Development Year 2015-2035. The overarching law regulating oil and gas activities in Indonesia is Law No. 22 dated 23 November 2001, with the following objectives:

- Guarantee effective, efficient, highly competitive and sustainable exploration and exploitation
- Assure accountable processing, transport, storage and commercial businesses through fair and transparent business competition
- Guarantee the efficient and effective supply of oil and gas as a source of energy and to meet domestic needs
- Promote national capacity
- Increase state income
- Enhance public welfare and prosperity equitably, while maintaining the conservation of the environment

Law No.22 stipulates that upstream activities are controlled through "Joint Cooperation Contracts" between the business entity/permanent establishment and the executing agency (SKK Migas) (Article 6). Downstream activities are controlled by business licenses issued by the regulatory agency (BPH Migas) (Article 7). SKK Migas and BPH Migas supervise upstream and downstream activities respectively to ensure resource conservation, resource management, good practice of safety and technical norms, environmental conservation, and development of local capabilities. The key relevant laws governing the downstream sector include:

- Decree No.31/2013 on Expatriate Utilisation and the Development of Indonesian Employees in the Oil and Gas Business
- The Energy Law No.30/2007 providing a legal framework for overall energy sector
- Investment Law No. 25/2007 on the permitted mode of investment
- Company Law No. 40/2007 providing obligations for companies undertaking business activities in the natural resources field
- Environmental Law No.32/2009 on compliance with environmental quality requirements and permits
- Forestry Law No.41/1999 which prohibits oil and gas activities in protected forest areas
- Regulations PBI No.13/21/PBI/2011, PBI 14/25/PBI/2012 and 16/10/PBI/2014 from Bank Indonesia which regulate export proceeds and foreign exchange

Regulation PBI 17/3/2015 from Bank Indonesia regarding mandatory use of Rupiah for cash and non-cash transaction in Indonesia

The Ministry of Energy and Mineral Resources (MoEMR) is charged with creating and implementing Indonesia's energy policy, ensuring that the related business activities are in accordance with the relevant laws and regulations, and awarding contracts. It is also responsible for the National Masterplan for the transmission and distribution of natural gas. The MoEMR is divided into directorates with the Directorate General of Oil and Gas (DGOG) responsible for the preparation, implementation, direction, supervision and implementation of various policies in oil and gas industry.

BPH Migas was established on 30 December 2002 to assume Pertamina's regulatory role in relation to downstream activities (Articles 46 and 47 of Law No.22). BPH Migas is charged with assuring sufficient

natural gas and domestic fuel supplies and the safe operation of refining, storage, transportation and distribution of gas and petroleum products via business licences.

Nexant does not expect any significant changes to the current regulatory framework associated with the downstream and petrochemical industries in Indonesia in the immediate future. The Indonesia government has identified petrochemicals as a key industry focus area, and is expected to work with key industry players to attract investment as part of its refining and petrochemicals developments.

Section 5 Industry Competitiveness

5.1 COMPETITIVENESS POSITIONING

The demand for the SEA polyolefins market currently stood at around 10.5 million tons in 2016, and is estimated to grow to a market size of approximately 18.5 million tons in 2027, at a CAGR of 4.4 percent, supported by end-use demand in packaging, electrical/electronics, household products, construction materials and automotive components.

This provides an opportunity for existing producers, such as Lotte Titan Chemical to sell to its primary customer base, with a logistics advantage over other producers outside of the region to reach individual countries in SEA. In particular, with respect to the Company's key markets of Malaysia and Indonesia, it benefits from Malaysia and Indonesia being a party to the ASEAN Free Trade Area (AFTA) agreement, where it can sell into both these markets without requirement to pay applicable tariffs for polyolefin sales, which is applicable to non-ASEAN producers (except for China, Japan and Australia).

In China, Lotte Titan Chemical competes with local producers, in addition to producers from South Korea, the Middle East, Singapore, Taiwan and Japan, and can sell LLDPE and PP to this market without tariff penalties selling LDPE and PP (which is not the case for non-ASEAN producers).

5.1.1 Olefins

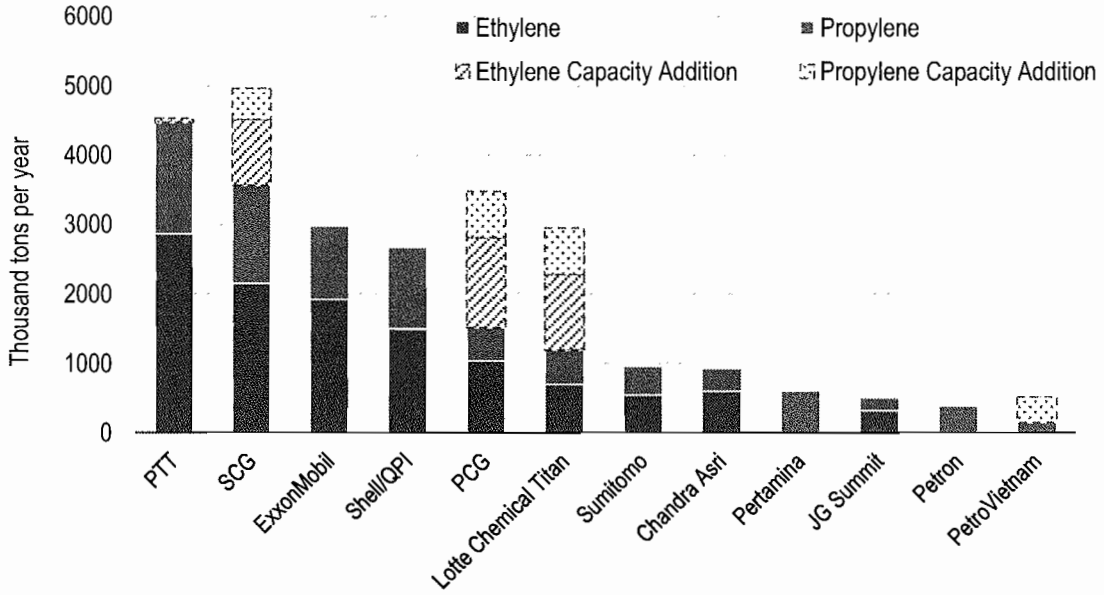
Olefins supply in SEA primarily consists of regional companies operating from a domestic base. However, international players, including Shell Chemicals, ExxonMobil and Sumitomo, also have olefins capacity in the region. All major olefins producing companies have forward integration into polyolefins. A number of producers, including PTT Global Chemical, PCG and Shell Chemicals, also have integration into other derivatives including styrene, ethylene oxide and ethylene glycol.

Lotte Chemical Titan has a total olefins capacity of nearly 1.2 million tons per year. The company plans to increase its ethylene and propylene capacity by 92 000 and 170 000 tons per year in the second half of 2017 in Malaysia. Lotte Chemical Titan is currently evaluating the potential of a new cracker of up to one million tons in Indonesia which is expected to commence its operation by 2022.

The Siam Cement Group (SCG) completed an agreement to purchase a 30 percent equity stake in CAP in September 2011. CAP expanded its steam cracker to 860 000 tons per year with the new capacity expected to be fully operational by 2016. SCG is also focusing on building a new ethylene cracker with a capacity of 950 000 tons per year in Vietnam for Long Son Petrochemical (LSP) Project in Vietnam.

The RAPID project currently being developed by PCG in Malaysia will include around 2 million tons per year of olefins capacity as well as its downstream derivatives. The project is scheduled to commence production in around 2020.

Figure 5.1 Top Ten Olefins Producers in SEA
(Capacity basis 2016, ranked by current capacity)



Firm competitor olefins capacity additions (up to 2020) are noted as follows:

- PCG (under RAPID project in Malaysia) plans to build up a new ethylene capacity of 1.3 million tons and propylene 663 000 tons per year in 2020
- Vietnamese-based PetroVietnam's Nghi Son Refinery and Petrochemical plans to obtain propylene 370 000 tons per year from its refinery in 2018

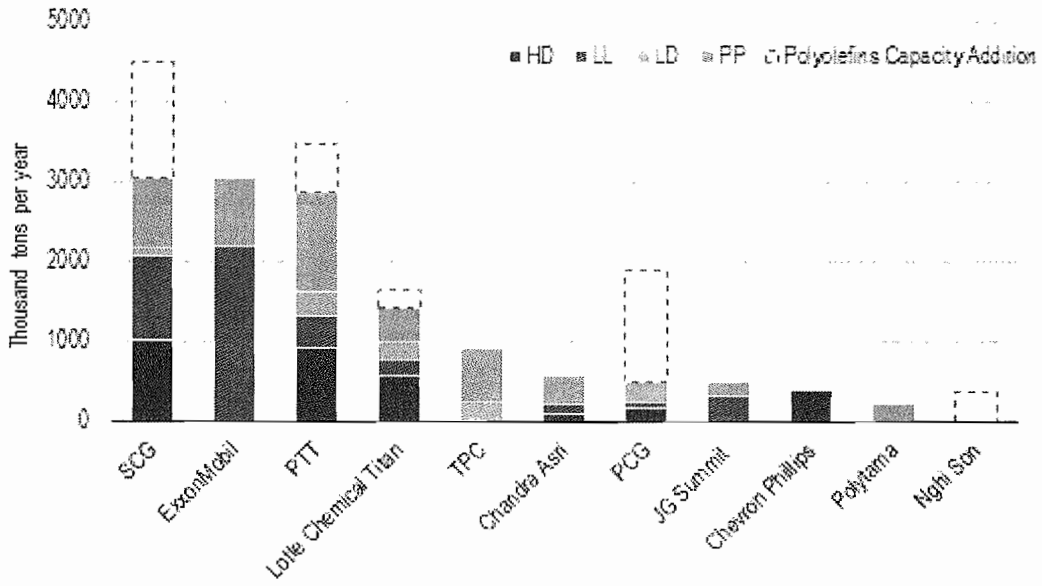
SCG (under LSP project in Vietnam) plans to build a new ethylene capacity of 950 000 tons per year and propylene capacity of 450 000 tons per year but EPC activities have not yet commenced and so commencement of commercial operations would most likely occur post 2020.

5.1.2 Polyolefins

Polyolefins supply in SEA largely consists of regional players operating from a domestic base. In terms of regional market share, the market is dominated by these companies; Siam Cement Group ("SCG") (Thailand), PTT, ExxonMobil, and Lotte Chemical Titan. Combined, these companies account for over 70 percent of regional polyolefins capacity. Additionally, major international players such as Sumitomo and Chevron Philips also have an operational presence in the region. Leading polyolefin players typically produce most product grades (HDPE, LDPE, LLDPE and PP).

Lotte Chemical Titan has a total polyolefins capacity of nearly 1.4 million tons per year, making it one of the largest polyolefins producers by capacity in SEA. The company plans to increase its polypropylene capacity by 120 000 tons per year in the second half of 2017 in Malaysia. Lotte Chemical Titan is currently evaluating the potential of a new cracker complex which could include polyolefin plants although this project is yet to be confirmed to go ahead.

Figure 5.2 Top Ten Polyolefins Producers in SEA
(Capacity basis 2016, ranked by current capacity)



Firm competitor polyolefins capacity additions (up to 2020) are noted as follows:

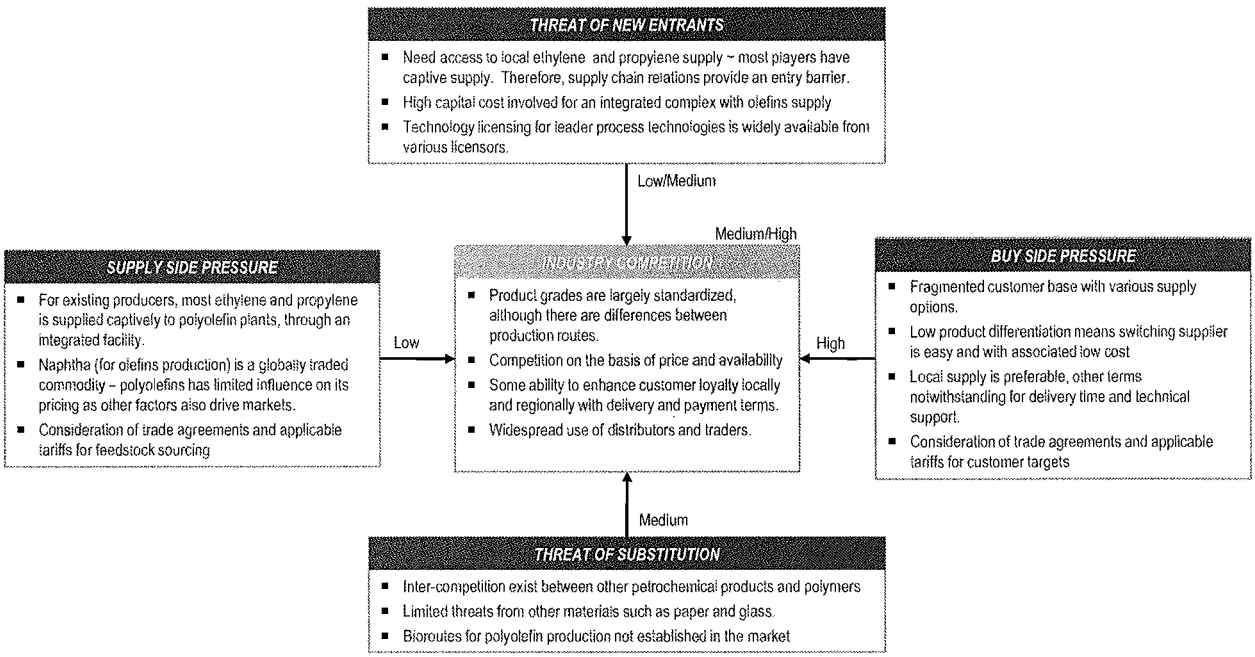
- SCG (under LSP project in Vietnam) plans to add around 1.4 million tons of total polyolefins along with a new ethylene capacity of 950 000 tons per year and propylene capacity of 450 000 tons per year post 2020
- IRPC, a subsidiary of PTT, plans to add a total 300 000 tons per year of polypropylene in 2017 as well as PTT plans to add a 300 000 tons per year LLDPE in 2018
- PCG (under RAPID project in Malaysia) plans to add around 1.4 million tons of total polyolefins along with a new ethylene capacity of 1.3 million tons and propylene 663 000 tons per year in 2020
- Vietnamese-based PetroVietnam's Nghi Son Refinery and Petrochemical plans to add around 370 000 tons per year of polypropylene along with the propylene from its refinery in 2018

5.2 PORTER'S FIVE FORCES ANALYSIS

The Porter's Five Forces analysis considers threats from (feedstock) suppliers, buyers (polyolefin consumers), substitute products (such as paper, glass, or other petrochemical products), and other potential entrants as a means of discussing industry competition or "competitive intensity". A high competitive intensity represents an industry where competitive forces have narrowed margins. .

Such an analysis is outlined for the polyolefins industry below, the primary products of Lotte Chemical Titan. The impact from suppliers, buyers, substitute products, new entrants, and competitive intensity is rated on a qualitative scale of low, medium and high, with high indicating higher competition or influence.

Figure 5.3 Five Forces Analysis of Polyolefins Industry



Appendix A Glossary and Nexant Methodology

A.1 OVERVIEW OF NEXANT METHODOLOGIES

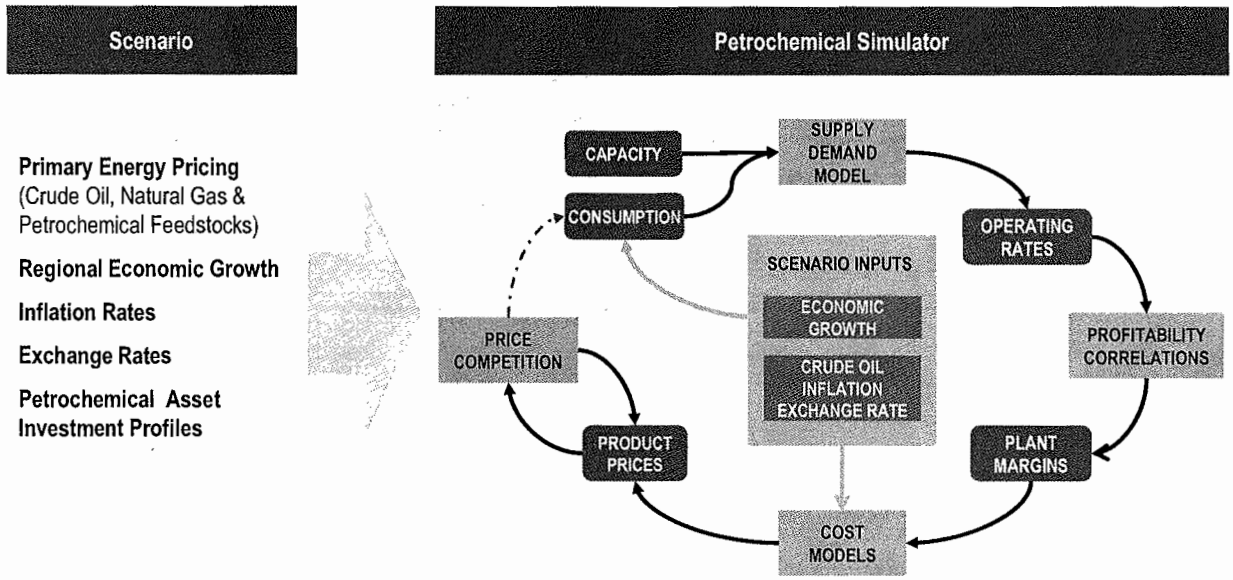
A.1.1 Market Dynamics and Profitability

The methodology for undertaking industry analysis – covering markets, industry structure, and pricing – includes consideration of the complex interactions between consumption drivers, capacity additions, and regional economics (taking account of regional GDP growth and inflation).

This methodology is the basis for the proprietary simulation model developed by Nexant of the global petroleum and petrochemicals industry. The advanced simulator is a fully integrated model of the global business dynamics (material flows and cash flows) using sophisticated software. The industry outlooks draw on more than 40 years of knowledge and experience of the global industry to develop algorithms to simulate petrochemical business dynamics.

The forecast methodology relates market demand drivers to petrochemical consumption. From a database of petrochemical processes and plant capacity, the regional consumption is compared to the ability to produce. Global trade algorithms complete a full supply, demand and trade model of the industry. Basic commodity theory dictates that market tightness (level of production versus available production capacity), is the primary driver of profitability. Production costs are built up from a detailed database of representative production cost models for regional producers, which are heavily influenced by assumptions of crude oil and energy prices. Petrochemical product prices are determined by adding projected production costs to the margin outlook. Inter-regional competition and inter-material competition add further constraints and complexity to shape the pricing dynamics.

Figure A.1 Petrochemical Industry Simulator Forecast Methodology



Source: Nexant

A.1.2 Pricing Basis

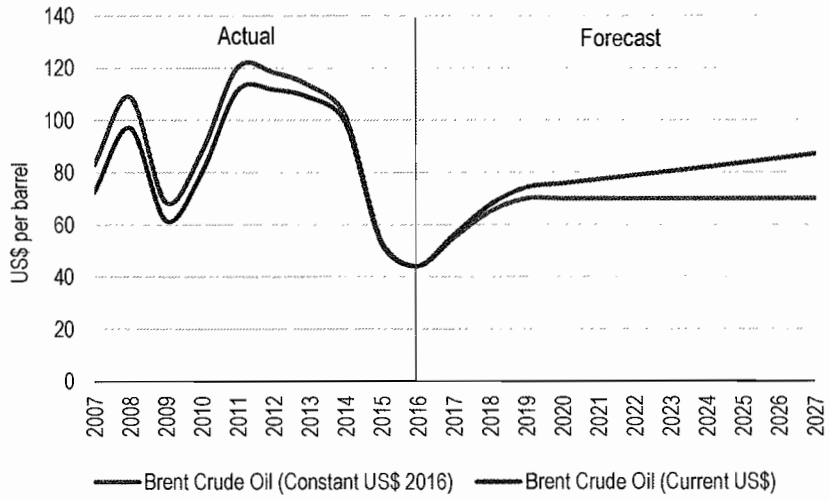
A.1.2.1 Crude Oil Scenario

Developments in crude oil markets have shown considerable volatility and unpredictability due to diversity of drivers. For this Report, Nexant has used the following scenario for the study, based on Brent FOB

crude oil, noting that short term volatility and wide fluctuations in pricing may continue to occur in the longer term:

- **Oil scenario for Report:** set at a long term US$70 per barrel (2016 constant dollars)

Figure A.2 Crude Oil Price Scenarios
(Brent, Spot FOB North Sea)

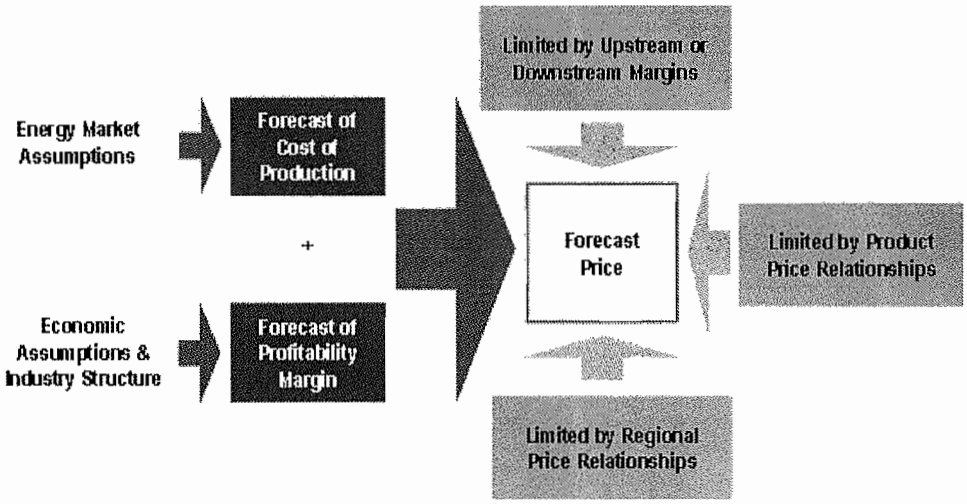


Source: Nexant

A.1.2.2 Price Influences

Nexant's integrated approach used to forecast prices for petrochemicals combines separate forecasts for the primary influences; cash production costs (which for the majority of producers in price influencing regions such as Asia are strongly influenced by crude oil price) and cash margins (which are strongly influenced by industry operating rates (total level of production versus available production capacity, for respective regions).

Figure A.3 Petrochemical Price Influences



Source: Nexant

Secondary influences on the price may place a ceiling or floor on the preliminary price projection derived from cost plus margin:

- **Forecast prices in other regions** - Inter-regional price spreads are assessed to ensure consistency with projected trade flows.
- **Relationship to other petrochemical products** - Where products with similar properties compete in an end use application, inter-product competition imposes price relationships between the products. Consumers have opportunity to switch product, choosing the one that offers best value.
- **Profitability of upstream and downstream processes** - Margins must be distributed in a balanced manner between different parts of the value chain for the whole petrochemical industry to be sustainable in the long term.

A.1.3 Cost Competitiveness

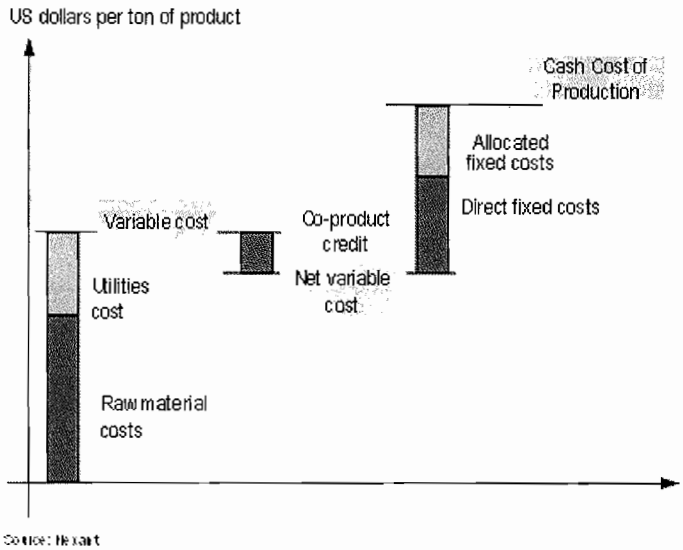
Nexant uses a standard pro-forma to calculate cash costs of production for petrochemicals (which has been applied to the ethylene cost curve analysis). As Figure 6.4 indicates, the variable cost of production includes the costs of raw materials – feedstocks plus catalysts and chemicals – and utilities at cash cost or purchase cost, with a credit for co-products (by-products or secondary products made in conjunction with primary product). The direct fixed costs shown on Figure 6.4 include:

- Salaries of operating staff plus associated on-costs such as social insurance, fringe benefits etc.
- Maintenance costs including materials and labour, with periodic maintenance costs such as two or three year shutdowns averaged over the period; maintenance costs are usually calculated as a percentage of process plant capital cost.

The allocated fixed costs are the site charges, which are necessary for production but which are not directly associated with the operation of the specified process plant. They include packing and warehousing, storage and workshops, site laboratories, safety and environment, security, site management, and on-site amenities for the workers. Insurance of the fixed assets is also counted under allocated fixed costs.

As defined by Nexant for its analyses of production costs and its price forecasting, the cash cost does not include corporate overheads such as general marketing, company administration, and R&D nor does it include working capital.

Figure A.4 Components of Cash Cost of Production



A.2 REPORT SUPPLY, DEMAND AND TRADE DATA

Figures in thousand tons

Ethylene										
Consumption	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	35608	31697	32552	34110	34282	34364	35443	35158	36608	37244
Europe	27586	25242	23697	25184	24813	23609	23613	23930	24032	24539
Middle East/Africa	12701	13384	16232	20224	22660	23921	24819	25523	27394	28907
China	11002	11047	11874	15241	16294	16562	17919	19234	20454	21805
SEA	6528	6520	6739	7342	8064	8968	9553	10032	10269	10300
Malaysia	*1379*	*1400*	*1400*	*1337*	*1368*	*1479*	*1417*	*1369*	*1416*	*1394*
Indonesia	*1003*	*1010*	*1114*	*1051*	*1043*	*1145*	*1241*	*1226*	*1193*	*1384*
Asia Pacific (exc. SEA and China)	21134	20666	20782	21198	21041	20359	21508	21467	22467	23728
Production	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	36088	31748	32620	34093	34308	34436	35844	35351	36949	37425
Europe	27059	24818	23258	24939	24444	23313	23278	23941	24091	24676
Middle East/Africa	13845	14884	17207	21109	23844	24956	25290	25886	27446	29778
China	10192	10100	10664	14446	15259	14868	15971	17735	18953	20594
SEA	5996	6066	6360	7033	7651	8295	8895	9654	9819	9961
Malaysia	*1525*	*1654*	*1574*	*1517*	*1533*	*1600*	*1480*	*1470*	*1500*	*1601*
Indonesia	*491*	*548*	*531*	*540*	*468*	*470*	*594*	*590*	*426*	*765*
Asia Pacific (exc. SEA and China)	21035	20539	21182	21310	21489	21263	22712	22732	23451	24089
Annualised Firm Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	40376	39668	37645	38160	38731	38844	38842	38166	40117	41600
Europe	31055	31239	30559	30525	30764	30101	30227	28858	28860	29625
Middle East/Africa	15041	17112	20709	25486	27889	28651	29055	30304	32134	35293
China	10550	10579	11259	14835	15707	16248	17740	19575	21311	22654
SEA	6681	6856	6957	9243	9791	9812	10377	10913	11013	11289
Malaysia	*1701*	*1701*	*1711*	*1741*	*1741*	*1741*	*1741*	*1741*	*1741*	*1741*
Indonesia	*536*	*600*	*600*	*600*	*600*	*600*	*600*	*600*	*439*	*860*
Asia Pacific (exc. SEA and China)	21663	22635	22907	23829	24479	24721	24751	24776	24955	25323
Speculative Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	0	0	0	0	0	0	0	0	0	0
Europe	0	0	0	0	0	0	0	0	0	0
Middle East/Africa	0	0	0	0	0	0	0	0	0	0
China	0	0	0	0	0	0	0	0	0	0
SEA	0	0	0	0	0	0	0	0	0	0
Malaysia	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Indonesia	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Asia Pacific (exc. SEA and China)	0	0	0	0	0	0	0	0	0	0
Total Annualised Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	40376	39668	37645	38160	38731	38844	38842	38166	40117	41600
Europe	31055	31239	30559	30525	30764	30101	30227	28858	28860	29625
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SEA	6681	6856	6957	9243	9791	9812	10377	10913	11013	11289
Malaysia	*1701*	*1701*	*1711*	*1741*	*1741*	*1741*	*1741*	*1741*	*1741*	*1741*
Indonesia	*536*	*600*	*600*	*600*	*600*	*600*	*600*	*600*	*439*	*860*
Asia Pacific (exc. SEA and China)	21663	22635	22907	23829	24479	24721	24751	24776	24955	25323
Operating Rate	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	89%	80%	87%	89%	89%	89%	92%	93%	92%	90%
Europe	87%	79%	76%	82%	79%	77%	77%	83%	83%	83%
Middle East/Africa	92%	87%	83%	83%	85%	87%	87%	85%	85%	84%
China	97%	95%	95%	97%	97%	92%	90%	91%	89%	91%
SEA	90%	88%	91%	76%	78%	85%	86%	88%	89%	88%
Malaysia	*90%*	*97%*	*92%*	*87%*	*88%*	*92%*	*85%*	*84%*	*86%*	*92%*
Indonesia	*92%*	*91%*	*89%*	*90%*	*78%*	*78%*	*99%*	*98%*	*97%*	*89%*
Asia Pacific (exc. SEA and China)	97%	91%	92%	89%	88%	86%	92%	92%	94%	95%

Ethylene											
Consumption	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	38485	42360	43577	44327	45464	46509	48320	49853	51780	52889	53611
Europe	24045	24489	25482	25999	26637	27654	28619	29914	30690	30959	30868
Middle East/Africa	29637	30507	32070	32457	33891	34692	35823	37454	39895	44638	47487
China	24426	25995	27292	28401	29134	29748	31066	33714	35327	37176	39336
SEA	10933	10984	10945	12170	12062	12865	13607	14341	14828	16028	16706
Malaysia	*1392*	*1411*	*1399*	*2163*	*2123*	*2134*	*2158*	*2221*	*2288*	*2252*	*2224*
Indonesia	*1383*	*1399*	*1391*	*1359*	*1348*	*2035*	*2627*	*2820*	*2912*	*3738*	*3684*
Asia Pacific (exc. SEA and China)	24908	24855	24803	24920	24899	26017	26299	27151	29440	30068	31021
Production	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	38525	42380	43517	44287	45517	46564	48313	49821	51728	52944	53645
Europe	24300	24605	25430	26154	26777	27854	28751	29931	30802	30906	30786
Middle East/Africa	30552	31470	33001	33172	34457	35121	36339	38127	40561	45460	48191
China	23595	24983	26790	27971	28722	29326	30515	33278	34755	36672	38790
SEA	10571	10566	10366	11679	11535	12482	13467	14030	14627	15849	16541
Malaysia	*1601*	*1594*	*1593*	*2401*	*2360*	*2400*	*2416*	*2471*	*2542*	*2484*	*2436*
Indonesia	*757*	*774*	*740*	*705*	*697*	*1516*	*2360*	*2388*	*2531*	*3431*	*3350*
Asia Pacific (exc. SEA and China)	24891	25186	25065	25011	25079	26138	26350	27240	29487	29928	31076
Annualised Firm Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	44234	49475	51292	52006	52864	52864	52864	53008	52864	52864	52864
Europe	29354	29845	31005	32442	33100	33100	34100	34193	34100	34100	34100
Middle East/Africa	35613	35990	38282	38988	39880	39880	39880	39991	39880	39880	39880
China	25676	27115	29415	30801	30717	30717	30717	30801	30717	30717	30717
SEA	11770	11816	11816	14094	14066	14066	14066	14094	14066	14066	14066
Malaysia	*1787*	*1833*	*1833*	*3133*	*3133*	*3133*	*3133*	*3133*	*3133*	*3133*	*3133*
Indonesia	*860*	*860*	*860*	*860*	*860*	*860*	*860*	*860*	*860*	*860*	*860*
Asia Pacific (exc. SEA and China)	26909	27046	27046	27120	27046	27046	27046	27120	27046	27046	27046
Speculative Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	0	0	0	0	1550	2100	3450	4212	4950	7350	8650
Europe	0	0	800	802	1200	1500	1700	2407	3000	4100	4700
Middle East/Africa	100	100	300	652	1750	2350	3550	4763	6300	12750	16400
China	400	1200	2400	3209	4400	4700	5800	7621	8000	11700	15500
SEA	0	0	0	0	0	1000	2100	2501	2800	4550	6150
Malaysia	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Indonesia	*0*	*0*	*0*	*0*	*0*	*1000*	*2000*	*2000*	*2000*	*3200*	*3200*
Asia Pacific (exc. SEA and China)	0	400	800	1304	1700	2000	2400	3008	4350	5500	7400
Total Annualised Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	44234	49475	51292	52006	54414	54964	56314	57220	57814	60214	61514
Europe	29354	29845	31805	33244	34300	34600	35800	36599	37100	38200	38800
Middle East/Africa	35713	36090	38582	39640	41630	42230	43430	44754	46180	52630	56280
China	26076	28315	31815	34010	35117	35417	36517	38422	38717	42417	46217
SEA	11770	11816	11816	14094	14066	15066	16166	16595	16866	18616	20216
Malaysia	*1787*	*1833*	*1833*	*3133*	*3133*	*3133*	*3133*	*3133*	*3133*	*3133*	*3133*
Indonesia	*860*	*860*	*860*	*860*	*860*	*1860*	*2860*	*2860*	*2860*	*4060*	*4060*
Asia Pacific (exc. SEA and China)	26909	27446	27846	28424	28746	29046	29446	30128	31396	32546	34446
Operating Rate	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	87%	86%	85%	85%	84%	85%	86%	87%	89%	88%	87%
Europe	83%	82%	80%	79%	78%	81%	80%	82%	83%	81%	79%
Middle East/Africa	86%	87%	86%	84%	83%	83%	84%	85%	88%	86%	86%
China	90%	88%	84%	82%	82%	83%	84%	87%	90%	86%	84%
SEA	90%	89%	88%	83%	82%	83%	83%	85%	87%	85%	82%
Malaysia	*90%*	*87%*	*87%*	*77%*	*75%*	*77%*	*77%*	*79%*	*81%*	*79%*	*78%*
Indonesia	*88%*	*90%*	*86%*	*82%*	*81%*	*82%*	*83%*	*84%*	*89%*	*85%*	*83%*
Asia Pacific (exc. SEA and China)	93%	92%	90%	88%	87%	90%	89%	90%	94%	92%	90%

Propylene										
Consumption	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	18254	15969	15932	17087	16780	17174	17051	16961	17289	17589
Europe	19528	18052	17378	18302	17788	17527	17720	18263	18222	18442
Middle East/Africa	3521	4317	5311	6409	7150	7881	8067	8870	9642	10067
China	11269	11676	12371	13871	15144	17202	19793	21949	24210	26427
SEA	3967	3973	4082	4589	4736	5665	5976	6123	6085	6014
Malaysia	*737*	*698*	*710*	*779*	*737*	*790*	*683*	*662*	*658*	*628*
Indonesia	*660*	*650*	*565*	*652*	*503*	*827*	*839*	*857*	*803*	*811*
Asia Pacific (exc. SEA and China)	15421	14864	15638	17172	17024	16716	17731	17543	17735	18913
Production	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	18430	15827	16045	17182	16890	17373	17350	17003	17456	18117
Europe	19157	17978	17279	18305	17821	17491	17622	18164	17879	17935
Middle East/Africa	3705	4566	5570	6503	7303	8094	8286	8967	9760	10651
China	9905	10486	10605	12182	13522	14905	17156	18882	21401	24435
SEA	3950	3774	3790	4754	5279	5618	6019	6240	6193	6420
Malaysia	*839*	*854*	*786*	*896*	*861*	*910*	*740*	*750*	*770*	*636*
Indonesia	*456*	*456*	*325*	*491*	*516*	*476*	*651*	*630*	*453*	*803*
Asia Pacific (exc. SEA and China)	16150	15712	16943	18232	18512	18513	20034	20003	20233	19894
Annualised Firm Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	19904	20104	19323	18959	19398	19349	19329	18909	19129	20015
Europe	20174	20641	20330	20459	20614	20240	20608	20101	20068	19950
Middle East/Africa	4558	5772	7710	9211	10267	10531	10669	11306	12104	12820
China	11683	11915	12500	15006	16269	17679	18991	21864	26208	29223
SEA	4416	4734	4874	5916	6476	6567	7112	7416	7771	8271
Malaysia	*974*	*1089*	*1089*	*1089*	*1089*	*1089*	*1089*	*1089*	*1089*	*1089*
Indonesia	*533*	*555*	*608*	*608*	*608*	*608*	*779*	*788*	*737*	*1078*
Asia Pacific (exc. SEA and China)	16704	17497	18590	19811	20323	20731	20974	21151	21597	22110
Speculative Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	0	0	0	0	0	0	0	0	0	0
Europe	0	0	0	0	0	0	0	0	0	0
Middle East/Africa	0	0	0	0	0	0	0	0	0	0
China	0	0	0	0	0	0	0	0	0	0
SEA	0	0	0	0	0	0	0	0	0	0
Malaysia	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Indonesia	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Asia Pacific (exc. SEA and China)	0	0	0	0	0	0	0	0	0	0
Total Annualised Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	19904	20104	19323	18959	19398	19349	19329	18909	19129	20015
Europe	20174	20641	20330	20459	20614	20240	20608	20101	20068	19950
Middle East/Africa	4558	5772	7710	9211	10267	10531	10669	11306	12104	12820
China	11683	11915	12500	15006	16269	17679	18991	21864	26208	29223
SEA	4416	4734	4874	5916	6476	6567	7112	7416	7771	8271
Malaysia	*974*	*1089*	*1089*	*1089*	*1089*	*1089*	*1089*	*1089*	*1089*	*1089*
Indonesia	*533*	*555*	*608*	*608*	*608*	*608*	*779*	*788*	*737*	*1078*
Asia Pacific (exc. SEA and China)	16704	17497	18590	19811	20323	20731	20974	21151	21597	22110
Operating Rate	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	93%	79%	83%	91%	87%	90%	90%	90%	91%	91%
Europe	95%	87%	85%	89%	86%	86%	86%	90%	89%	90%
Middle East/Africa	81%	79%	72%	71%	71%	77%	78%	79%	81%	83%
China	85%	88%	85%	81%	83%	84%	90%	86%	82%	84%
SEA	89%	80%	78%	80%	82%	86%	85%	84%	80%	78%
Malaysia	*86%*	*78%*	*72%*	*82%*	*79%*	*84%*	*68%*	*69%*	*71%*	*58%*
Indonesia	*86%*	*82%*	*53%*	*81%*	*85%*	*78%*	*84%*	*80%*	*61%*	*74%*
Asia Pacific (exc. SEA and China)	97%	90%	91%	92%	91%	89%	96%	95%	94%	90%

Propylene											
Consumption	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	17734	18606	18884	19556	20046	20435	21573	22457	23454	23673	24064
Europe	18457	18707	19223	19098	19611	20104	20902	21678	22404	23190	23208
Middle East/Africa	10246	10894	11024	11396	12076	13040	13263	14004	14694	16521	18292
China	29799	31438	33612	34531	34918	36130	37892	39971	42465	44191	45149
SEA	6323	6924	7133	8434	8332	8745	9492	9888	10218	10883	11807
Malaysia	*634*	*838*	*845*	*1712*	*1723*	*1742*	*1778*	*1835*	*1872*	*1861*	*1824*
Indonesia	*812*	*830*	*834*	*822*	*817*	*1156*	*1705*	*1758*	*1798*	*2055*	*2547*
Asia Pacific (exc. SEA and China)	19395	20263	20648	20404	20853	21063	21398	22737	24335	25384	25919
Production	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	18583	19245	19626	19995	20453	21092	22180	22919	23437	23990	24201
Europe	17703	18038	18621	19178	19481	19982	20681	21383	22391	23211	23154
Middle East/Africa	10790	11170	11389	11874	12545	13422	13536	14575	15341	17298	18773
China	27897	29933	32197	32389	32919	34243	36138	38247	41097	42303	43834
SEA	6778	7216	7328	8602	8679	8998	9842	10082	10476	11100	12063
Malaysia	*704*	*818*	*831*	*1653*	*1720*	*1699*	*1778*	*1823*	*1866*	*1844*	*1800*
Indonesia	*788*	*804*	*795*	*729*	*808*	*1089*	*1732*	*1775*	*1796*	*2062*	*2550*
Asia Pacific (exc. SEA and China)	20203	21230	21363	21381	21760	21780	22143	23529	24827	25940	26415
Annualised Firm Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	20920	21744	21789	22306	22368	22597	22597	22657	22597	22597	22597
Europe	19659	19916	20266	20519	20656	20656	21196	21255	21196	21196	21196
Middle East/Africa	13025	13180	13804	14066	14028	14028	14028	14066	14028	14028	14028
China	33018	34498	36473	37746	37643	37643	37643	37746	37643	37643	37643
SEA	8602	8874	9057	10191	10170	10170	10170	10191	10170	10170	10170
Malaysia	*1174*	*1259*	*1259*	*1922*	*1922*	*1922*	*1922*	*1922*	*1922*	*1922*	*1922*
Indonesia	*1078*	*1078*	*1078*	*1078*	*1078*	*1078*	*1078*	*1078*	*1078*	*1078*	*1078*
Asia Pacific (exc. SEA and China)	22711	22908	23282	23346	23282	23282	23282	23346	23282	23282	23282
Speculative Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	0	0	500	501	1242	1778	2814	3424	3414	4314	5014
Europe	0	-16	463	1066	1116	1666	1768	2026	2727	3883	4837
Middle East/Africa	13	13	67	187	897	2008	2008	2851	3593	6020	8087
China	333	1425	1737	2510	3742	4685	5913	6826	8841	11975	14245
SEA	0	0	0	201	350	850	1616	1830	1828	2703	4035
Malaysia	*0*	*0*	*0*	*0*	*150*	*150*	*300*	*301*	*300*	*300*	*300*
Indonesia	*0*	*0*	*0*	*0*	*0*	*500*	*1060*	*1060*	*1060*	*1600*	*2070*
Asia Pacific (exc. SEA and China)	-100	80	259	1045	942	984	1103	1414	2126	3241	4787
Total Annualised Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	20920	21744	22289	22807	23610	24375	25411	26081	26011	26911	27611
Europe	19659	19900	20729	21584	21772	22322	22964	23281	23922	25078	26032
Middle East/Africa	13038	13193	13871	14253	14925	16036	16036	16917	17621	20048	22115
China	33352	35922	38210	40256	41385	42328	43556	44573	46484	49618	51888
SEA	8602	8874	9057	10391	10520	11020	11785	12021	11997	12873	14205
Malaysia	*1174*	*1259*	*1259*	*1922*	*2072*	*2072*	*2222*	*2223*	*2222*	*2222*	*2222*
Indonesia	*1078*	*1078*	*1078*	*1078*	*1078*	*1578*	*2138*	*2138*	*2138*	*2678*	*3148*
Asia Pacific (exc. SEA and China)	22611	22988	23541	24391	24224	24267	24385	24760	25408	26523	28069
Operating Rate	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	89%	89%	88%	88%	87%	87%	87%	88%	90%	89%	88%
Europe	90%	91%	90%	89%	89%	90%	90%	92%	94%	93%	89%
Middle East/Africa	83%	85%	82%	83%	84%	84%	84%	86%	87%	86%	85%
China	84%	83%	84%	80%	80%	81%	83%	86%	88%	85%	84%
SEA	79%	81%	81%	83%	82%	82%	84%	84%	87%	86%	85%
Malaysia	*60%*	*65%*	*66%*	*86%*	*83%*	*82%*	*80%*	*82%*	*84%*	*83%*	*81%*
Indonesia	*73%*	*75%*	*74%*	*68%*	*75%*	*69%*	*81%*	*83%*	*84%*	*77%*	*81%*
Asia Pacific (exc. SEA and China)	89%	92%	91%	88%	90%	90%	91%	95%	98%	98%	94%

Butadiene										
Consumption	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	2588	2201	1943	2223	2255	2054	1989	1928	1937	1936
Europe	2585	2468	2121	2493	2608	2544	2543	2572	2606	2593
Middle East/Africa	160	141	118	138	135	121	118	128	154	201
China	1569	1527	1699	1988	2189	2405	2596	2601	2706	2888
SEA	328	374	421	456	414	353	390	424	533	673
Malaysia	*45*	*96*	*148*	*159*	*146*	*149*	*153*	*151*	*183*	*217*
Indonesia	*57*	*55*	*50*	*59*	*60*	*58*	*59*	*61*	*55*	*64*
Asia Pacific (exc. SEA and China)	2715	2623	2505	2944	2893	2840	2937	2920	3036	3013
Production	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	2483	2015	1806	1994	2101	1893	1906	1804	1789	1794
Europe	2843	2713	2441	2782	2832	2773	2657	2694	2786	2955
Middle East/Africa	217	209	195	260	274	270	255	295	297	316
China	1401	1425	1430	1850	2080	2100	2205	2410	2430	2719
SEA	265	324	335	416	428	427	484	616	697	611
Malaysia	*0*	*83*	*96*	*91*	*75*	*88*	*85*	*71*	*92*	*79*
Indonesia	*0*	*0*	*0*	*0*	*0*	*0*	*10*	*76*	*64*	*70*
Asia Pacific (exc. SEA and China)	2802	2648	2588	2964	2849	2803	2901	2850	2889	2909
Annualised Firm Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	3240	3246	3028	2881	2881	2944	2984	2984	2984	2992
Europe	3315	3412	3377	3393	3401	3407	3432	3453	3699	3873
Middle East/Africa	249	250	249	355	365	365	365	365	365	384
China	1648	1659	1800	2334	2458	2670	3033	3341	3408	3586
SEA	250	335	350	454	505	507	527	693	743	705
Malaysia	*0*	*84*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*
Indonesia	*0*	*0*	*0*	*0*	*0*	*0*	*22*	*100*	*73*	*100*
Asia Pacific (exc. SEA and China)	2900	3059	3067	3084	3207	3240	3285	3469	3469	3485
Speculative Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	0	0	0	0	0	0	0	0	0	0
Europe	0	0	0	0	0	0	0	0	0	0
Middle East/Africa	0	0	0	0	0	0	0	0	0	0
China	0	0	0	0	0	0	0	0	0	0
SEA	0	0	0	0	0	0	0	0	0	0
Malaysia	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Indonesia	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Asia Pacific (exc. SEA and China)	0	0	0	0	0	0	0	0	0	0
Total Annualised Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	3240	3246	3028	2881	2881	2944	2984	2984	2984	2992
Europe	3315	3412	3377	3393	3401	3407	3432	3453	3699	3873
Middle East/Africa	249	250	249	355	365	365	365	365	365	384
China	1648	1659	1800	2334	2458	2670	3033	3341	3408	3586
SEA	250	335	350	454	505	507	527	693	743	705
Malaysia	*0*	*84*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*
Indonesia	*0*	*0*	*0*	*0*	*0*	*0*	*22*	*100*	*73*	*100*
Asia Pacific (exc. SEA and China)	2900	3059	3067	3084	3207	3240	3285	3469	3469	3485
Operating Rate	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	77%	62%	60%	69%	73%	64%	64%	60%	60%	60%
Europe	86%	80%	72%	82%	83%	81%	77%	78%	75%	76%
Middle East/Africa	87%	84%	78%	73%	75%	74%	70%	81%	81%	82%
China	85%	86%	79%	79%	85%	79%	73%	72%	71%	76%
SEA	106%	97%	96%	92%	85%	84%	92%	89%	94%	87%
Malaysia	*0%*	*99%*	*96%*	*91%*	*75%*	*88%*	*85%*	*71%*	*92%*	*78%*
Indonesia	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*45%*	*76%*	*88%*	*70%*
Asia Pacific (exc. SEA and China)	97%	87%	84%	96%	89%	87%	88%	82%	83%	83%

Butadiene											
Consumption	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	1917	1919	1908	1917	1929	1952	1980	1992	2044	2050	2050
Europe	2655	2683	2676	2752	2858	2947	3005	3041	3107	3262	3370
Middle East/Africa	240	268	332	333	363	372	378	475	499	541	566
China	3183	3461	3578	3667	3772	3819	3970	4055	4245	4410	4551
SEA	694	779	827	840	875	895	955	1178	1232	1308	1403
Malaysia	*227*	*239*	*250*	*260*	*269*	*280*	*294*	*398*	*420*	*434*	*448*
Indonesia	*67*	*133*	*164*	*165*	*164*	*170*	*178*	*207*	*220*	*246*	*248*
Asia Pacific (exc. SEA and China)	3068	3103	3213	3245	3189	3212	3267	3302	3437	3492	3488
Production	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	1836	1914	1915	1929	1921	1954	1987	2018	2036	2060	2065
Europe	2994	3012	3103	2986	3112	3214	3340	3284	3460	3615	3624
Middle East/Africa	335	331	336	395	402	410	408	631	646	670	688
China	2919	3303	3431	3508	3602	3622	3723	3702	3834	4006	4104
SEA	698	673	658	921	940	953	995	1217	1336	1453	1537
Malaysia	*80*	*81*	*82*	*232*	*236*	*237*	*239*	*277*	*340*	*363*	*362*
Indonesia	*70*	*71*	*76*	*116*	*111*	*123*	*137*	*130*	*174*	*191*	*208*
Asia Pacific (exc. SEA and China)	2975	2980	3091	3015	3009	3044	3102	3191	3252	3259	3410
Annualised Firm Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	2984	2984	2984	2992	2984	2984	2984	2992	2984	2984	2984
Europe	3862	3862	3862	3873	3862	3862	3985	3996	3985	3985	3985
Middle East/Africa	405	405	405	405	404	404	404	405	404	405	405
China	3747	3838	4058	4380	4368	4368	4368	4380	4368	4368	4368
SEA	780	780	780	1054	1052	1052	1052	1054	1052	1052	1052
Malaysia	*100*	*100*	*100*	*292*	*292*	*292*	*292*	*292*	*292*	*292*	*292*
Indonesia	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*
Asia Pacific (exc. SEA and China)	3504	3504	3504	3514	3504	3504	3504	3514	3504	3504	3504
Speculative Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	0	0	0	0	0	0	0	0	0	50	50
Europe	0	0	50	50	130	260	290	291	500	660	660
Middle East/Africa	0	0	0	80	80	80	80	331	330	375	400
China	0	75	150	226	275	275	375	501	550	575	775
SEA	0	0	0	100	100	125	175	524	673	773	930
Malaysia	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*50*	*125*	*150*	*150*
Indonesia	*0*	*0*	*0*	*50*	*50*	*75*	*100*	*100*	*175*	*175*	*200*
Asia Pacific (exc. SEA and China)	0	0	125	125	25	25	75	201	200	200	400
Total Annualised Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	2984	2984	2984	2992	2984	2984	2984	2992	2984	3034	3034
Europe	3862	3862	3912	3923	3992	4122	4275	4287	4485	4645	4645
Middle East/Africa	405	405	405	485	484	484	484	736	734	780	805
China	3747	3913	4208	4606	4643	4643	4743	4881	4918	4943	5143
SEA	780	780	780	1155	1152	1177	1227	1578	1725	1825	1982
Malaysia	*100*	*100*	*100*	*293*	*292*	*292*	*292*	*343*	*417*	*442*	*442*
Indonesia	*100*	*100*	*100*	*150*	*150*	*175*	*200*	*200*	*275*	*275*	*300*
Asia Pacific (exc. SEA and China)	3504	3504	3629	3639	3529	3529	3579	3714	3704	3704	3904
Operating Rate	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	62%	64%	64%	64%	64%	65%	67%	67%	68%	68%	68%
Europe	78%	78%	79%	76%	78%	78%	78%	77%	77%	78%	78%
Middle East/Africa	83%	82%	83%	81%	83%	85%	84%	86%	88%	86%	85%
China	78%	84%	82%	76%	78%	78%	78%	76%	78%	81%	80%
SEA	89%	86%	84%	80%	82%	81%	81%	77%	77%	80%	78%
Malaysia	*80%*	*81%*	*82%*	*79%*	*81%*	*81%*	*82%*	*81%*	*81%*	*82%*	*82%*
Indonesia	*70%*	*71%*	*76%*	*78%*	*74%*	*70%*	*69%*	*65%*	*63%*	*69%*	*69%*
Asia Pacific (exc. SEA and China)	85%	85%	85%	83%	85%	86%	87%	86%	88%	88%	87%

Polyethylene										
Consumption	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	20331	18458	17902	19566	19862	20221	20758	21084	21111	21577
Europe	18008	16657	15349	16545	17083	16864	16822	16558	16914	17237
Middle East/Africa	5990	6248	6638	7092	7417	7867	8252	8530	8931	9459
China	12176	12130	15299	17805	18421	18873	20292	22007	23385	24828
SEA	3818	3787	3963	4231	4443	4799	4989	5171	5424	5708
Malaysia	978	949	992	977	1010	1042	1077	1115	1153	1205
Indonesia	754	750	794	840	918	1070	1130	1176	1237	1317
Asia Pacific (exc. SEA and China)	9350	9121	9042	9801	10177	10277	10481	11013	11421	11915
Production	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	22142	19837	20761	21107	20884	21521	21764	21589	22621	22649
Europe	16728	15550	15156	15929	15538	14862	14914	15152	15168	15339
Middle East/Africa	7952	8477	10274	12697	14124	15325	16220	16576	18156	18860
China	7349	7301	7669	10333	10780	10719	11612	13171	13523	14237
SEA	4440	4406	4509	4753	5615	6364	6864	7514	7650	7910
Malaysia	982	960	961	874	905	975	970	953	976	958
Indonesia	496	501	583	526	570	607	745	760	665	664
Asia Pacific (exc. SEA and China)	10728	10549	10421	10616	10785	10456	11105	11163	11547	11729
Annualised Firm Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	24226	24242	23748	23753	23895	23909	23960	24059	24182	25007
Europe	19087	18976	19027	19010	19180	18833	18832	18455	18192	18601
Middle East/Africa	9170	9525	12012	14866	16408	17180	18478	18716	20251	21986
China	7388	7463	7962	10668	11076	11516	13051	14351	15546	16609
SEA	4858	5060	5250	6001	7177	8299	8399	8977	9200	9526
Malaysia	1000	1001	1000	1000	1000	1057	1055	1055	1055	1056
Indonesia	550	661	750	769	790	832	830	830	830	833
Asia Pacific (exc. SEA and China)	11306	11622	11730	12196	12525	13014	13029	12997	13224	14004
Speculative Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	0	0	0	0	0	0	0	0	0	200
Europe	0	0	0	0	0	0	0	0	0	0
Middle East/Africa	0	0	0	0	0	0	0	0	0	0
China	0	0	0	0	0	0	0	0	0	0
SEA	0	0	0	0	0	0	0	0	0	0
Malaysia	0	0	0	0	0	0	0	0	0	0
Indonesia	0	0	0	0	0	0	0	0	0	0
Asia Pacific (exc. SEA and China)	0	0	0	0	0	0	0	0	0	0
Total Annualised Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	24226	24242	23748	23753	23895	23909	23960	24059	24182	25207
Europe	19087	18976	19027	19010	19180	18833	18832	18455	18192	18601
Middle East/Africa	9170	9525	12012	14866	16408	17180	18478	18716	20251	21986
China	7388	7463	7962	10668	11076	11516	13051	14351	15546	16609
SEA	4858	5061	5250	6001	7177	8300	8399	8977	9200	9527
Malaysia	1000	1002	1000	1000	1000	1058	1055	1055	1055	1057
Indonesia	550	661	750	769	790	832	830	830	830	833
Asia Pacific (exc. SEA and China)	11306	11622	11730	12196	12525	13014	13029	12997	13224	14004
Operating Rate	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	91%	82%	87%	89%	87%	90%	91%	90%	94%	90%
Europe	88%	82%	80%	84%	81%	79%	79%	82%	83%	82%
Middle East/Africa	87%	89%	86%	85%	86%	89%	88%	89%	90%	86%
China	99%	98%	96%	97%	97%	93%	89%	92%	87%	86%
SEA	91%	87%	86%	79%	78%	77%	82%	84%	83%	83%
Malaysia	98%	96%	96%	87%	91%	92%	92%	90%	93%	91%
Indonesia	90%	76%	78%	68%	72%	73%	90%	92%	80%	80%
Asia Pacific (exc. SEA and China)	95%	91%	89%	87%	86%	80%	85%	86%	87%	84%

Polyethylene											
Consumption	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	22170	23017	23725	24228	24618	25099	25871	26978	28293	29575	30595
Europe	17643	18057	18373	18611	18814	19102	19553	20154	20801	21358	21731
Middle East/Africa	9932	10685	11110	11368	11578	11980	12685	13665	14732	15612	16109
China	26364	27860	29406	30856	31822	32890	34302	36141	38273	40386	42157
SEA	6032	6355	6629	6844	7039	7266	7570	7960	8394	8818	9162
Malaysia	1261	1320	1373	1415	1454	1500	1560	1635	1718	1799	1868
Indonesia	1405	1490	1565	1625	1681	1744	1824	1925	2035	2143	2231
Asia Pacific (exc. SEA and China)	12524	13169	13741	14212	14634	15093	15683	16432	17279	18117	18825
Production	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	23939	26676	27403	27092	28150	28882	30368	31796	33258	34274	34296
Europe	15090	15222	16332	16828	17453	18096	19028	20390	21163	21250	20989
Middle East/Africa	19198	19766	21145	22034	22131	22517	22828	24023	24822	27651	30370
China	15323	16121	16805	17927	18308	18537	19143	19914	21575	22949	23975
SEA	8002	8070	8080	9225	9098	9936	10642	11030	11412	11832	12499
Malaysia	929	946	932	1555	1531	1540	1560	1619	1668	1626	1584
Indonesia	642	646	643	627	620	1372	1938	2013	2091	2138	2232
Asia Pacific (exc. SEA and China)	13113	13288	13219	13013	13365	13462	13655	14177	15542	15910	16450
Annualised Firm Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	27095	30482	31288	31426	31888	31888	31888	31974	31888	31888	31888
Europe	18703	18894	20293	21702	22389	22389	22989	23052	22989	22989	22989
Middle East/Africa	22961	23411	25433	27027	27405	27405	27405	27476	27405	27805	27805
China	19237	20457	21139	22478	22417	22417	22417	22478	22417	22417	22417
SEA	9927	9927	9927	11610	11577	11577	11577	11609	11577	11577	11577
Malaysia	1055	1055	1055	1809	1805	1805	1805	1809	1805	1805	1805
Indonesia	830	830	830	833	830	830	830	833	830	830	830
Asia Pacific (exc. SEA and China)	15966	16120	16120	16165	16120	16120	16120	16164	16120	16120	16120
Speculative Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	200	200	200	200	1350	1950	3250	3659	4150	6300	7400
Europe	0	-100	180	-161	290	1090	1345	2000	2145	2945	3335
Middle East/Africa	0	0	0	0	75	375	375	777	775	4425	8500
China	0	0	0	281	700	1728	2100	2407	3350	5000	7300
SEA	0	0	0	0	0	1000	1750	1750	1750	2600	3850
Malaysia	0	0	0	0	0	0	0	0	0	0	0
Indonesia	0	0	0	0	0	1000	1750	1750	1750	1900	2100
Asia Pacific (exc. SEA and China)	-120	-380	-450	-451	250	250	250	251	1300	2150	3250
Total Annualised Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	27295	30682	31488	31626	33238	33838	35138	35633	36038	38188	39288
Europe	18703	18794	20473	21542	22679	23479	24334	25052	25134	25934	26324
Middle East/Africa	22961	23411	25433	27027	27480	27780	27780	28253	28180	32230	36305
China	19237	20457	21139	22759	23117	24145	24517	24884	25767	27417	29717
SEA	9927	9927	9927	11611	11577	12577	13327	13360	13327	14177	15427
Malaysia	1055	1055	1055	1810	1805	1805	1805	1810	1805	1805	1805
Indonesia	830	830	830	833	830	1830	2580	2583	2580	2730	2930
Asia Pacific (exc. SEA and China)	15846	15740	15670	15714	16370	16370	16370	16414	17420	18270	19370
Operating Rate	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	88%	87%	87%	86%	85%	85%	86%	89%	92%	90%	87%
Europe	81%	81%	80%	78%	77%	77%	78%	81%	84%	82%	80%
Middle East/Africa	84%	84%	83%	82%	81%	81%	82%	85%	88%	86%	84%
China	80%	79%	79%	79%	79%	77%	78%	80%	84%	84%	81%
SEA	81%	81%	81%	79%	79%	79%	80%	83%	86%	83%	81%
Malaysia	88%	90%	88%	86%	85%	85%	86%	89%	92%	90%	88%
Indonesia	77%	78%	77%	75%	75%	75%	75%	78%	81%	78%	76%
Asia Pacific (exc. SEA and China)	83%	84%	84%	83%	82%	82%	83%	86%	89%	87%	85%

Polypropylene										
Consumption	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	10061	9493	8934	9816	9675	9880	10108	10017	10379	10615
Europe	10029	9505	8885	9620	10303	10259	10240	10511	10941	11158
Middle East/Africa	4129	4240	4300	4620	4858	4953	5200	5367	5697	6078
China	10847	10783	13142	13625	14267	15868	17367	18743	19796	20912
SEA	2955	2904	3114	3371	3545	3837	4045	4205	4435	4763
Malaysia	371	364	341	353	367	381	396	411	427	514
Indonesia	869	869	888	965	1045	1168	1263	1355	1431	1513
Asia Pacific (exc. SEA and China)	7290	7019	7246	8105	8137	8710	8618	8880	9877	10283
Production	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	10942	9657	9853	10170	9859	9947	9850	9873	10185	9988
Europe	10950	10369	10143	10450	10452	10259	10436	10772	11148	10915
Middle East/Africa	3166	4039	5001	5962	6560	7218	7485	8035	8613	8858
China	7347	7650	8205	9168	9956	11216	12760	13705	15976	17744
SEA	3019	3016	2961	3394	3583	4263	4430	4496	4536	4517
Malaysia	484	414	376	404	395	484	378	368	365	385
Indonesia	540	530	438	520	370	695	690	665	620	653
Asia Pacific (exc. SEA and China)	9643	9408	9804	10715	10705	10690	10926	11367	11511	11787
Annualised Firm Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	11707	11955	11890	11722	11839	11512	11392	11412	11390	11379
Europe	12310	12400	12244	11839	11769	11668	11899	12164	12165	12318
Middle East/Africa	3722	4679	6575	8096	9166	9281	9557	9654	10517	10544
China	8685	8995	9573	12101	13341	14651	16175	17928	20258	22436
SEA	3501	3601	3595	4124	4705	5011	5000	5034	5145	5184
Malaysia	470	470	470	470	470	470	390	390	390	419
Indonesia	625	665	665	665	736	765	765	765	765	765
Asia Pacific (exc. SEA and China)	9810	10282	11131	12022	12152	12464	12953	12317	12786	13277
Speculative Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	0	0	0	0	0	0	0	0	0	0
Europe	0	0	0	0	0	0	0	0	0	0
Middle East/Africa	0	0	0	0	0	0	0	0	0	0
China	0	0	0	0	0	0	0	0	0	0
SEA	0	0	0	0	0	0	0	0	0	0
Malaysia	0	0	0	0	0	0	0	0	0	0
Indonesia	0	0	0	0	0	0	0	0	0	0
Asia Pacific (exc. SEA and China)	0	0	0	0	0	0	0	0	0	0
Total Annualised Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	11707	11955	11890	11722	11839	11512	11392	11412	11390	11379
Europe	12310	12400	12244	11839	11769	11668	11899	12164	12165	12318
Middle East/Africa	3722	4679	6575	8096	9166	9281	9557	9654	10517	10544
China	8685	8995	9573	12101	13341	14651	16175	17928	20258	22436
SEA	3501	3603	3595	4124	4705	5013	5000	5034	5145	5186
Malaysia	470	470	470	470	470	470	390	390	390	419
Indonesia	625	667	665	665	736	767	765	765	765	767
Asia Pacific (exc. SEA and China)	9810	10282	11131	12022	12152	12464	12953	12317	12786	13277
Operating Rate	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	93%	81%	83%	87%	83%	86%	86%	87%	89%	88%
Europe	89%	84%	83%	88%	89%	88%	88%	89%	92%	89%
Middle East/Africa	85%	86%	76%	74%	72%	78%	78%	83%	82%	84%
China	85%	85%	86%	76%	75%	77%	79%	76%	79%	79%
SEA	86%	84%	82%	82%	76%	85%	89%	89%	88%	87%
Malaysia	103%	88%	80%	86%	84%	103%	97%	94%	94%	92%
Indonesia	86%	79%	66%	78%	50%	91%	90%	87%	81%	85%
Asia Pacific (exc. SEA and China)	98%	91%	88%	89%	88%	86%	84%	92%	90%	89%

Polypropylene											
Consumption	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	10983	11522	11931	12221	12458	12741	13154	13714	14358	14968	15441
Europe	11384	11556	11662	11743	11838	12041	12373	12784	13173	13442	13554
Middle East/Africa	6359	6890	7014	7042	7087	7374	7930	8679	9403	9861	9967
China	22293	23713	25117	26377	26944	27621	28622	30004	31628	33217	34507
SEA	5054	5337	5583	5781	5963	6174	6451	6803	7197	7576	7892
Malaysia	534	548	558	563	575	593	620	654	688	715	734
Indonesia	1612	1715	1812	1894	1965	2039	2127	2238	2367	2500	2620
Asia Pacific (exc. SEA and China)	10913	11567	12149	12646	13093	13574	14165	14893	15702	16488	17143
Production	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	9945	10462	10642	11001	11063	11346	12344	13127	13738	14103	14448
Europe	10813	11117	11469	11330	11891	12025	12619	13116	13360	13853	13739
Middle East/Africa	8828	9269	9462	9978	10253	11165	11297	11780	12458	13849	15279
China	20052	21237	22797	23826	24326	24681	25415	26991	28662	28996	29126
SEA	4681	5144	5373	6370	6269	6623	7201	7479	7628	8264	8684
Malaysia	405	595	606	1385	1366	1373	1386	1435	1465	1452	1425
Indonesia	641	650	658	636	631	956	1474	1521	1556	1803	1766
Asia Pacific (exc. SEA and China)	12667	13356	13713	13305	13581	13685	13819	14384	15615	16487	17228
Annualised Firm Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	11388	11443	11481	11925	11914	12193	12243	12276	12243	12243	12243
Europe	12285	12485	12566	12852	13246	13246	13646	13683	13646	13646	13646
Middle East/Africa	10517	10967	11043	11446	11717	11717	11717	11747	11717	11717	11717
China	26135	27253	28850	30546	30463	30463	30463	30546	30463	30463	30463
SEA	5447	5907	6115	7529	7515	7515	7515	7529	7515	7515	7515
Malaysia	440	640	640	1540	1540	1540	1540	1540	1540	1540	1540
Indonesia	765	765	765	765	765	765	765	765	765	765	765
Asia Pacific (exc. SEA and China)	14489	14927	15125	15166	15125	15125	15125	15166	15125	15125	15125
Speculative Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	0	400	400	802	1100	1100	2100	2407	2800	3400	4100
Europe	0	0	165	166	560	660	810	812	810	1510	1660
Middle East/Africa	0	0	0	752	1000	2100	2100	2106	2700	4450	6550
China	0	0	0	602	1800	2400	3000	3610	4800	5600	6400
SEA	0	0	0	0	0	400	1000	1000	1000	1800	2500
Malaysia	0	0	0	0	0	0	0	0	0	0	0
Indonesia	0	0	0	0	0	400	1000	1000	1000	1300	1300
Asia Pacific (exc. SEA and China)	0	0	0	0	600	600	600	602	1700	2800	4000
Total Annualised Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	11388	11843	11881	12727	13014	13293	14343	14683	15043	15643	16343
Europe	12285	12485	12731	13018	13806	13906	14456	14496	14456	15156	15306
Middle East/Africa	10517	10967	11043	12198	12717	13817	13817	13853	14417	16167	18267
China	26135	27253	28850	31148	32263	32863	33463	34156	35263	36063	36863
SEA	5447	5907	6115	7531	7515	7915	8515	8529	8515	9315	10015
Malaysia	440	640	640	1540	1540	1540	1540	1540	1540	1540	1540
Indonesia	765	765	765	767	765	1165	1765	1765	1765	2065	2065
Asia Pacific (exc. SEA and China)	14489	14927	15125	15166	15725	15725	15725	15767	16825	17925	19125
Operating Rate	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	87%	88%	90%	86%	85%	85%	86%	89%	91%	90%	88%
Europe	88%	89%	90%	87%	86%	86%	87%	90%	92%	91%	90%
Middle East/Africa	84%	85%	86%	82%	81%	81%	82%	85%	86%	86%	84%
China	77%	78%	79%	76%	75%	75%	76%	79%	81%	80%	79%
SEA	86%	87%	88%	85%	83%	84%	85%	88%	90%	89%	87%
Malaysia	92%	93%	95%	90%	89%	89%	90%	93%	95%	94%	93%
Indonesia	84%	85%	86%	83%	82%	82%	84%	86%	88%	87%	86%
Asia Pacific (exc. SEA and China)	87%	89%	91%	88%	86%	87%	88%	91%	93%	92%	90%

Benzene										
Consumption	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	10565	9287	8352	9274	9027	9132	9032	8983	9143	9001
Europe	11384	10199	9052	10300	10092	9721	9549	9290	9311	9565
Middle East/Africa	1323	1468	1806	2449	2619	2794	2837	2799	2849	3082
China	4706	5135	5644	7110	7942	8506	9164	9867	10396	11576
SEA	2075	2012	2093	2141	2100	2251	2529	2516	2518	2394
Malaysia	195	203	186	170	194	195	198	192	193	195
Indonesia	208	239	271	271	320	325	340	283	269	282
Asia Pacific (exc. SEA and China)	10880	9857	10257	10765	10224	9935	10432	10147	10164	9902
Production	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	9667	8450	7469	8439	8010	7908	7881	7466	7352	7289
Europe	10731	9676	8978	9743	9412	9275	9151	8866	8834	8961
Middle East/Africa	1898	2148	2157	2552	2588	2766	2756	2714	2863	3346
China	4378	4871	5359	7030	7843	8116	8306	9341	9283	10134
SEA	2391	2019	1949	2554	2682	2633	2892	2948	2759	2786
Malaysia	280	248	257	274	217	242	251	231	222	239
Indonesia	545	231	180	305	380	101	147	222	92	121
Asia Pacific (exc. SEA and China)	11982	11286	10853	11839	11470	11744	12365	12483	13046	13025
Annualised Firm Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	12148	12042	11622	11250	11043	10599	10612	10521	10492	10520
Europe	14014	14124	13594	13522	13640	13645	13683	13008	12777	12895
Middle East/Africa	2560	2896	3159	3542	3696	3706	3759	4200	4451	4599
China	6303	7331	9406	10827	12331	13477	14828	15759	16182	16510
SEA	2378	2301	2682	3216	3307	2970	3439	3736	3423	3504
Malaysia	309	285	285	285	285	285	285	285	285	285
Indonesia	525	191	292	525	505	125	192	290	125	125
Asia Pacific (exc. SEA and China)	12908	13466	13417	13897	13885	13774	13906	14449	15087	15211
Speculative Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	0	0	0	0	0	0	0	0	0	0
Europe	0	0	0	0	0	0	0	0	0	0
Middle East/Africa	0	0	0	0	0	0	0	0	0	0
China	0	0	0	0	0	0	0	0	0	0
SEA	0	0	0	0	0	0	0	0	0	0
Malaysia	0	0	0	0	0	0	0	0	0	0
Indonesia	0	0	0	0	0	0	0	0	0	0
Asia Pacific (exc. SEA and China)	0	0	0	0	0	0	0	0	0	0
Total Annualised Capacity	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	12148	12042	11622	11250	11043	10599	10612	10521	10492	10520
Europe	14014	14124	13594	13522	13640	13645	13683	13008	12777	12895
Middle East/Africa	2560	2896	3159	3542	3696	3706	3759	4200	4451	4599
China	6303	7331	9406	10827	12331	13477	14828	15759	16182	16510
SEA	2378	2301	2682	3216	3307	2970	3439	3736	3423	3504
Malaysia	309	285	285	285	285	285	285	285	285	285
Indonesia	525	191	292	525	505	125	192	290	125	125
Asia Pacific (exc. SEA and China)	12908	13466	13417	13897	13885	13774	13906	14449	15087	15211
Operating Rate	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Americas	80%	70%	64%	75%	73%	75%	74%	71%	70%	69%
Europe	77%	69%	66%	72%	69%	68%	67%	68%	69%	69%
Middle East/Africa	74%	74%	68%	72%	70%	75%	73%	65%	64%	73%
China	69%	66%	57%	65%	64%	60%	56%	59%	57%	61%
SEA	101%	88%	73%	79%	81%	89%	84%	79%	81%	80%
Malaysia	91%	87%	90%	96%	76%	85%	88%	81%	78%	84%
Indonesia	104%	121%	62%	58%	75%	81%	77%	77%	74%	97%
Asia Pacific (exc. SEA and China)	93%	84%	81%	85%	83%	85%	89%	86%	86%	86%

Benzene											
Consumption	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	9129	9389	9478	9439	9538	9877	10257	10483	10737	10707	10627
Europe	9379	9335	9579	9562	9643	9707	9904	10220	10579	10680	10515
Middle East/Africa	3504	3683	3758	3733	3912	4012	4088	4189	4643	4866	5183
China	12464	13030	13664	14306	14488	14794	15282	15817	16621	17684	18606
SEA	2782	2870	2884	3036	3048	3083	3144	3220	3310	3489	3833
Malaysia	201	210	208	365	366	369	376	382	390	389	382
Indonesia	344	345	344	362	359	366	375	378	404	441	433
Asia Pacific (exc. SEA and China)	9966	10481	10519	10493	10433	10490	10709	11317	11534	11848	11834
Production	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	7394	7571	7590	7561	7528	7607	7671	7778	8072	7990	7845
Europe	8868	8779	8810	8749	8791	8972	9292	9585	9921	9997	9878
Middle East/Africa	3536	3747	4205	4197	4194	4263	4512	4813	5186	6225	6509
China	10356	11167	11449	11612	12200	12262	12737	13576	14191	14642	15747
SEA	3487	3764	3951	4159	4113	4501	4703	4822	4911	5218	5386
Malaysia	296	356	485	618	611	611	611	626	640	626	626
Indonesia	368	372	373	369	369	603	718	734	747	958	930
Asia Pacific (exc. SEA and China)	13583	13760	13878	14291	14236	14358	14469	14672	15143	15202	15233
Annualised Firm Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	10515	10539	10539	10567	10539	10539	10539	10567	10539	10539	10539
Europe	12751	12788	12824	12859	12824	12824	13074	13109	13074	13074	13074
Middle East/Africa	4789	4987	5330	5378	5364	5364	5364	5378	5364	5364	5364
China	17311	17840	18151	18661	18610	18610	18610	18661	18610	18610	18610
SEA	4429	4736	4920	5145	5134	5134	5134	5145	5134	5134	5134
Malaysia	352	419	570	719	719	719	719	719	719	719	719
Indonesia	525	525	525	525	525	525	525	525	525	525	525
Asia Pacific (exc. SEA and China)	16146	16177	16177	16720	16675	16675	16675	16720	16675	16675	16675
Speculative Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	-50	-50	-50	-50	-50	-43	-38	-32	134	145	145
Europe	0	-107	-107	-107	-57	143	193	306	513	714	821
Middle East/Africa	0	0	224	225	259	284	509	787	1116	2378	2886
China	0	29	176	458	1022	1188	1555	2165	2785	3579	5532
SEA	0	0	0	0	0	526	704	773	770	1273	1525
Malaysia	0	0	0	0	0	0	0	0	0	0	0
Indonesia	0	0	0	0	0	326	478	479	478	755	755
Asia Pacific (exc. SEA and China)	0	0	0	32	32	32	32	48	328	486	817
Total Annualised Capacity	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	10465	10489	10489	10517	10489	10496	10501	10535	10673	10684	10684
Europe	12751	12681	12717	12752	12767	12967	13267	13415	13586	13787	13894
Middle East/Africa	4789	4987	5554	5603	5623	5648	5873	6165	6480	7742	8250
China	17311	17869	18327	19119	19632	19798	20165	20826	21395	22189	24142
SEA	4429	4736	4920	5145	5134	5660	5838	5916	5905	6408	6660
Malaysia	352	419	570	719	719	719	719	719	719	719	719
Indonesia	525	525	525	525	525	851	1003	1004	1003	1280	1280
Asia Pacific (exc. SEA and China)	16146	16177	16177	16752	16707	16707	16707	16768	17003	17160	17492
Operating Rate	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Americas	71%	72%	72%	72%	72%	72%	73%	74%	76%	75%	73%
Europe	70%	69%	69%	69%	69%	69%	70%	71%	73%	73%	71%
Middle East/Africa	74%	75%	76%	75%	75%	75%	77%	78%	80%	80%	79%
China	60%	62%	62%	61%	62%	62%	63%	65%	66%	66%	65%
SEA	79%	79%	80%	81%	80%	80%	81%	82%	83%	81%	81%
Malaysia	84%	85%	85%	86%	85%	85%	85%	87%	89%	87%	87%
Indonesia	70%	71%	71%	70%	70%	71%	72%	73%	74%	75%	73%
Asia Pacific (exc. SEA and China)	84%	85%	86%	85%	85%	86%	87%	88%	89%	89%	87%

Product	Country	Company	Location	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Ethylene	Indonesia	Chandra Asri Petrochemical	Anyer	600	600	600	600	600	600	600	600	600	860
Ethylene	Malaysia	Ethylene Malaysia	Kerteh	400	400	440	440	440	440	440	440	440	440
Ethylene	Malaysia	Lotte Chemical Titan	Pasir Gudang	429	429	429	429	429	429	429	429	429	429
Ethylene	Malaysia	Lotte Chemical Titan	Pasir Gudang	272	272	272	272	272	272	272	272	272	272
Ethylene	Malaysia	Optimal Olefins	Kerteh	600	600	600	600	600	600	600	600	600	600
Ethylene	Malaysia	Petronas	Pengerang	0	0	0	0	0	0	0	0	0	0
Ethylene	Philippines	JG Summit	Batangas	0	0	0	0	0	0	0	320	320	320
Ethylene	Singapore	ExxonMobil	Jurong Island	925	925	925	925	925	925	925	925	925	925
Ethylene	Singapore	ExxonMobil	Jurong Island	0	0	0	0	0	0	1 000	1 000	1 000	1 000
Ethylene	Singapore	PCS Singapore	Jurong Island	625	625	625	625	625	625	625	625	625	625
Ethylene	Singapore	PCS Singapore	Jurong Island	465	465	465	465	465	465	465	465	465	465
Ethylene	Singapore	Shell	Pulau Bukom	0	0	0	800	800	800	800	800	800	960
Ethylene	Thailand	IRPC	Rayong	360	360	360	360	360	360	360	360	433	433
Ethylene	Thailand	Map Ta Phut Olefins	Map Ta Phut	0	0	0	1 000	1 000	1 000	1 000	1 000	1 000	1 000
Ethylene	Thailand	PTT Global Chemical	Map Ta Phut	460	460	460	460	460	460	460	460	460	460
Ethylene	Thailand	PTT Global Chemical	Map Ta Phut	300	300	400	400	400	400	400	400	400	400
Ethylene	Thailand	PTT Global Chemical	Map Ta Phut	515	515	515	515	515	515	515	515	515	515
Ethylene	Thailand	PTT Global Chemical	Map Ta Phut	0	0	0	0	0	0	0	0	0	0
Ethylene	Thailand	PTT Polyethylene	Map Ta Phut	0	0	0	1 000	1 000	1 000	1 000	1 000	1 000	1 120
Ethylene	Thailand	Rayong Olefins	Map Ta Phut	900	900	900	900	900	900	900	900	900	900
Ethylene	Vietnam	Long Son Petrochemical	Long Son	0	0	0	0	0	0	0	0	0	0

Product	Country	Company	Location	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Process
Ethylene	Indonesia	Chandra Asri Petrochemical	Anyer	860	860	860	860	860	860	860	860	860	860	860	Steam cracker - naphtha
Ethylene	Malaysia	Ethylene Malaysia	Kerteh	440	440	440	440	440	440	440	440	440	440	440	Steam cracker - ethane
Ethylene	Malaysia	Lotte Chemical Titan	Pasir Gudang	521	521	521	521	521	521	521	521	521	521	521	Steam cracker - naphtha
Ethylene	Malaysia	Lotte Chemical Titan	Pasir Gudang	272	272	272	272	272	272	272	272	272	272	272	Steam cracker - naphtha
Ethylene	Malaysia	Optimal Olefins	Kerteh	600	600	600	600	600	600	600	600	600	600	600	Steam cracker - E/P
Ethylene	Malaysia	Petronas	Pengerang	0	0	0	1 300	1 300	1 300	1 300	1 300	1 300	1 300	1 300	Steam cracker - naphtha
Ethylene	Philippines	JG Summit	Batangas	320	320	480	480	480	480	480	480	480	480	480	Steam cracker - naphtha
Ethylene	Singapore	ExxonMobil	Jurong Island	925	925	925	925	925	925	925	925	925	925	925	Steam cracker - mixed feed
Ethylene	Singapore	ExxonMobil	Jurong Island	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	Steam cracker - mixed feed
Ethylene	Singapore	PCS Singapore	Jurong Island	625	625	625	625	625	625	625	625	625	625	625	Steam cracker - naphtha
Ethylene	Singapore	PCS Singapore	Jurong Island	465	465	465	465	465	465	465	465	465	465	465	Steam cracker - naphtha
Ethylene	Singapore	Shell	Pulau Bukom	960	960	960	960	960	960	960	960	960	960	960	Steam cracker - Naphtha/gasoil
Ethylene	Thailand	IRPC	Rayong	433	433	433	433	433	433	433	433	433	433	433	Steam cracker - naphtha
Ethylene	Thailand	Map Ta Phut Olefins	Map Ta Phut	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	Steam cracker - naphtha
Ethylene	Thailand	PTT Global Chemical	Map Ta Phut	460	460	460	460	460	460	460	460	460	460	460	Steam cracker - E/P
Ethylene	Thailand	PTT Global Chemical	Map Ta Phut	400	400	400	400	400	400	400	400	400	400	400	Steam cracker - ethane
Ethylene	Thailand	PTT Global Chemical	Map Ta Phut	515	515	515	515	515	515	515	515	515	515	515	Steam cracker - mixed feed
Ethylene	Thailand	PTT Global Chemical	Map Ta Phut	0	0	0	500	500	500	500	500	500	500	500	Steam cracker - naphtha
Ethylene	Thailand	PTT Polyethylene	Map Ta Phut	1 120	1 120	1 120	1 120	1 120	1 120	1 120	1 120	1 120	1 120	1 120	Steam cracker - ethane
Ethylene	Thailand	Rayong Olefins	Map Ta Phut	900	900	900	900	900	900	900	900	900	900	900	Steam cracker - naphtha
Ethylene	Vietnam	Long Son Petrochemical	Long Son	0	0	0	950	950	950	950	950	950	950	950	Steam cracker - mixed feed

Product	Country	Company	Location	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Propylene	Indonesia	Chandra Asri Petrochemical	Anyer	320	320	320	320	320	320	320	320	470	470
Propylene	Indonesia	EXOR I	Balongan	190	190	243	243	243	243	243	243	243	243
Propylene	Indonesia	Pertamina	Cilacap	0	0	0	0	0	0	0	0	140	140
Propylene	Indonesia	Pertamina	Pladju	45	45	45	45	45	45	45	45	45	45
Propylene	Indonesia	Pertamina	Balongan	0	0	0	0	0	0	180	180	180	180
Propylene	Malaysia	Lotte Chemical Titan	Pasir Gudang	0	115	115	115	115	115	115	115	115	115
Propylene	Malaysia	Lotte Chemical Titan	Pasir Gudang	220	220	220	220	220	220	220	220	220	220
Propylene	Malaysia	Lotte Chemical Titan	Pasir Gudang	158	158	158	158	158	158	158	158	158	158
Propylene	Malaysia	MTBE Malaysia	Kuantan	80	80	80	80	80	80	80	80	80	80
Propylene	Malaysia	Optimal Olefins	Kerteh	96	96	96	96	96	96	96	96	96	96
Propylene	Malaysia	Petronas	Kuantan	300	300	300	300	300	300	300	300	300	300
Propylene	Malaysia	Petronas	Pengerang	0	0	0	0	0	0	0	0	0	0
Propylene	Malaysia	Shell	Port Dickson	120	120	120	120	120	120	120	120	120	120
Propylene	Philippines	JG Summit	Batangas	0	0	0	0	0	0	0	190	190	190
Propylene	Philippines	Petron	Bataan	0	140	140	140	140	140	140	140	140	140
Propylene	Philippines	Petron	Bataan	0	0	0	0	0	0	0	0	0	250
Propylene	Singapore	ExxonMobil	Jurong Island	520	520	520	520	520	520	520	520	520	520
Propylene	Singapore	ExxonMobil	Jurong Island	0	0	0	0	0	0	540	540	540	540
Propylene	Singapore	PCS Singapore	Jurong Island	200	200	200	200	200	200	200	200	200	200
Propylene	Singapore	PCS Singapore	Jurong Island	380	380	380	380	380	380	380	380	380	380
Propylene	Singapore	PCS Singapore	Jurong Island	250	250	250	250	250	250	250	250	250	250
Propylene	Singapore	Shell	Pulau Bukom	100	100	100	100	100	100	100	100	100	100
Propylene	Singapore	Shell	Pulau Bukom	0	0	0	450	450	450	450	450	450	536
Propylene	Singapore	Singapore Refining	Jurong Island	110	110	110	110	110	110	110	110	110	110
Propylene	Thailand	HMC Polymers	Map Ta Phut	0	0	0	0	300	300	300	300	300	300
Propylene	Thailand	IRPC	Rayong	165	165	165	165	165	165	165	165	165	165
Propylene	Thailand	IRPC	Rayong	0	0	0	0	0	0	0	0	320	320
Propylene	Thailand	IRPC	Rayong	0	0	0	0	0	100	100	100	100	100
Propylene	Thailand	IRPC	Rayong	184	184	184	184	184	184	184	184	221	221
Propylene	Thailand	Map Ta Phut Olefins	Map Ta Phut	0	0	0	300	300	300	300	300	300	300
Propylene	Thailand	Map Ta Phut Olefins	Map Ta Phut	0	0	0	500	500	500	500	500	500	500
Propylene	Thailand	PTT Global Chemical	Map Ta Phut	135	135	135	135	135	135	135	135	135	135
Propylene	Thailand	PTT Global Chemical	Map Ta Phut	35	35	35	35	35	35	35	35	35	35
Propylene	Thailand	PTT Global Chemical	Map Ta Phut	23	23	30	30	31	31	31	31	31	31
Propylene	Thailand	PTT Global Chemical	Map Ta Phut	300	300	300	300	300	300	300	300	300	300
Propylene	Thailand	PTT Global Chemical	Map Ta Phut	0	0	0	0	0	0	0	0	0	0
Propylene	Thailand	Rayong Olefins	Map Ta Phut	440	468	468	468	468	468	468	468	468	468
Propylene	Thailand	Star Refinery	Map Ta Phut	110	110	110	110	110	110	110	110	110	110
Propylene	Vietnam	Long Son Petrochemical	Long Son	0	0	0	0	0	0	0	0	0	0
Propylene	Vietnam	PetroVietnam	Dung Quat	0	0	150	150	150	150	150	150	150	150
Propylene	Vietnam	PetroVietnam	Nghi Son	0	0	0	0	0	0	0	0	0	0

Product	Country	Company	Location	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Propylene	Indonesia	Chandra Asri Petrochemical	Anyer	470	470	470	470	470	470	470	470	470	470	470
Propylene	Indonesia	EXOR I	Balongan	243	243	243	243	243	243	243	243	243	243	243
Propylene	Indonesia	Pertamina	Cilacap	140	140	140	140	140	140	140	140	140	140	140
Propylene	Indonesia	Pertamina	Pladju	45	45	45	45	45	45	45	45	45	45	45
Propylene	Indonesia	Pertamina	Balongan	180	180	180	180	180	180	180	180	180	180	180
Propylene	Malaysia	Lotte Chemical Titan	Pasir Gudang	115	115	115	115	115	115	115	115	115	115	115
Propylene	Malaysia	Lotte Chemical Titan	Pasir Gudang	390	390	390	390	390	390	390	390	390	390	390
Propylene	Malaysia	Lotte Chemical Titan	Pasir Gudang	158	158	158	158	158	158	158	158	158	158	158
Propylene	Malaysia	MTBE Malaysia	Kuantan	80	80	80	80	80	80	80	80	80	80	80
Propylene	Malaysia	Optimal Olefins	Kerteh	96	96	96	96	96	96	96	96	96	96	96
Propylene	Malaysia	Petronas	Kuantan	300	300	300	300	300	300	300	300	300	300	300
Propylene	Malaysia	Petronas	Pengerang	0	0	0	663	663	663	663	663	663	663	663
Propylene	Malaysia	Shell	Port Dickson	120	120	120	120	120	120	120	120	120	120	120
Propylene	Philippines	JG Summit	Batangas	190	190	245	245	245	245	245	245	245	245	245
Propylene	Philippines	Petron	Bataan	140	140	140	140	140	140	140	140	140	140	140
Propylene	Philippines	Petron	Bataan	250	250	250	250	250	250	250	250	250	250	250
Propylene	Singapore	ExxonMobil	Jurong Island	520	520	520	520	520	520	520	520	520	520	520
Propylene	Singapore	ExxonMobil	Jurong Island	540	540	540	540	540	540	540	540	540	540	540
Propylene	Singapore	PCS Singapore	Jurong Island	200	200	200	200	200	200	200	200	200	200	200
Propylene	Singapore	PCS Singapore	Jurong Island	380	380	380	380	380	380	380	380	380	380	380
Propylene	Singapore	PCS Singapore	Jurong Island	250	250	250	250	250	250	250	250	250	250	250
Propylene	Singapore	Shell	Pulau Bukom	100	100	100	100	100	100	100	100	100	100	100
Propylene	Singapore	Shell	Pulau Bukom	536	536	536	536	536	536	536	536	536	536	536
Propylene	Singapore	Singapore Refining	Jurong Island	110	110	110	110	110	110	110	110	110	110	110
Propylene	Thailand	HMC Polymers	Map Ta Phut	300	300	300	300	300	300	300	300	300	300	300
Propylene	Thailand	IRPC	Rayong	165	165	165	165	165	165	165	165	165	165	165
Propylene	Thailand	IRPC	Rayong	320	320	320	320	320	320	320	320	320	320	320
Propylene	Thailand	IRPC	Rayong	100	100	100	100	100	100	100	100	100	100	100
Propylene	Thailand	IRPC	Rayong	221	221	221	221	221	221	221	221	221	221	221
Propylene	Thailand	Map Ta Phut Olefins	Map Ta Phut	300	300	300	300	300	300	300	300	300	300	300
Propylene	Thailand	Map Ta Phut Olefins	Map Ta Phut	500	500	500	500	500	500	500	500	500	500	500
Propylene	Thailand	PTT Global Chemical	Map Ta Phut	135	135	135	135	135	135	135	135	135	135	135
Propylene	Thailand	PTT Global Chemical	Map Ta Phut	35	35	35	35	35	35	35	35	35	35	35
Propylene	Thailand	PTT Global Chemical	Map Ta Phut	31	31	31	31	31	31	31	31	31	31	31
Propylene	Thailand	PTT Global Chemical	Map Ta Phut	300	300	300	300	300	300	300	300	300	300	300
Propylene	Thailand	PTT Global Chemical	Map Ta Phut	0	0	0	261	261	261	261	261	261	261	261
Propylene	Thailand	Rayong Olefins	Map Ta Phut	468	468	468	468	468	468	468	468	468	468	468
Propylene	Thailand	Star Refinery	Map Ta Phut	110	110	110	110	110	110	110	110	110	110	110
Propylene	Vietnam	Long Son Petrochemical	Long Son	0	0	0	450	450	450	450	450	450	450	450
Propylene	Vietnam	PetroVietnam	Dung Quat	150	150	150	150	150	150	150	150	150	150	150
Propylene	Vietnam	PetroVietnam	Nghi Son	0	400	400	400	400	400	400	400	400	400	400

Product	Country	Company	Location	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Butadiene	Indonesia	PT Petrokimia Butadiene	Anyer	0	0	0	0	0	0	100	100	100	100
Butadiene	Malaysia	Honam Petrochemical	Pasir Gudang	0	100	100	100	100	100	100	100	100	100
Butadiene	Malaysia	Petronas	Pengerang	0	0	0	0	0	0	0	0	0	0
Butadiene	Philippines	JG Summit Petrochemical	Batangas	0	0	0	0	0	0	0	0	0	0
Butadiene	Singapore	PCS Singapore	Jurong Island	60	60	60	60	60	60	60	60	60	60
Butadiene	Singapore	PCS Singapore	Jurong Island	0	0	0	0	0	0	0	100	100	100
Butadiene	Singapore	Shell	Pulau Bukom	0	0	0	155	155	155	155	155	155	155
Butadiene	Thailand	Bangkok Synthetics Co (BST)	Map Ta Phut	140	140	140	140	140	140	140	140	140	140
Butadiene	Thailand	IRPC	Rayong	50	50	50	50	50	50	50	50	50	50
Butadiene	Thailand	PTT Global Chemical	Map Ta Phut	0	0	0	0	0	0	0	75	75	75
Butadiene	Vietnam	Long Son Petrochemical	Long Son	0	0	0	0	0	0	0	0	0	0
HDPE	Indonesia	Chandra Asri Petrochemical	Anyer	100	100	100	120	120	140	140	140	140	140
HDPE	Indonesia	Lotte Chemical Titan	Merak, West Java	0	0	0	250	250	250	250	250	250	250
HDPE	Malaysia	Lotte Chemical Titan	Tanjung Langsat	115	115	115	115	115	115	115	115	115	115
HDPE	Malaysia	Lotte Chemical Titan	Pasir Gudang	220	220	220	220	220	220	220	220	220	220
HDPE	Malaysia	Petronas	Pengerang	0	0	0	0	0	0	0	0	0	0
HDPE	Malaysia	Polyethylene Malaysia	Kerteh	125	125	125	125	125	180	180	180	180	180
HDPE	Singapore	Chevron Phillips	Jurong Island	190	190	190	190	190	190	190	190	190	190
HDPE	Singapore	Chevron Phillips	Jurong Island	215	215	215	215	215	215	215	215	215	215
HDPE	Thailand	Bangkok Polyethylene	Map Ta Phut	250	250	250	250	250	250	250	250	250	250
HDPE	Thailand	Bangkok Polyethylene	Map Ta Phut	0	0	0	0	250	250	250	250	250	250
HDPE	Thailand	IRPC	Rayong	140	140	140	140	140	140	140	140	140	140
HDPE	Thailand	PTT Global Chemical	Map Ta Phut	250	250	250	300	300	300	300	300	300	300
HDPE	Thailand	Thai Polyethylene	Map Ta Phut	160	160	160	160	160	160	160	160	160	160
HDPE	Thailand	Thai Polyethylene	Map Ta Phut	180	180	180	180	180	180	180	180	180	180
HDPE	Thailand	Thai Polyethylene	Map Ta Phut	240	240	240	240	240	240	240	240	240	240
HDPE	Thailand	Thai Polyethylene	Map Ta Phut	0	0	0	400	400	400	400	400	400	400
HDPE	Vietnam	Long Son Petrochemical	Long Son	0	0	0	0	0	0	0	0	0	0
LLDPE	Indonesia	Chandra Asri Petrochemical	Anyer	200	200	200	200	200	200	200	200	200	200
LLDPE	Indonesia	Lotte Chemical Titan	Merak, West Java	0	200	200	200	200	200	200	200	200	200
LLDPE	Indonesia	PT Titan	Merak, West Java	250	250	250	250	0	0	0	0	0	0
LLDPE	Malaysia	Petronas	Pengerang	0	0	0	0	0	0	0	0	0	0
LLDPE	Malaysia	Polyethylene Malaysia	Kerteh	70	70	70	70	70	70	70	70	70	70
LLDPE	Philippines	JG Summit Petrochemical	Batangas	180	180	180	180	180	180	320	320	320	320
LLDPE	Philippines	NPC Alliance	Bataan	250	250	250	250	250	250	250	250	250	250
LLDPE	Singapore	ExxonMobil	Jurong Island	0	0	0	0	0	0	0	300	300	300
LLDPE	Singapore	ExxonMobil	Jurong Island	520	520	520	520	520	520	600	600	600	600
LLDPE	Singapore	ExxonMobil	Jurong Island	0	0	0	0	0	650	650	650	650	650
LLDPE	Singapore	ExxonMobil	Jurong Island	0	0	0	0	0	650	650	650	650	650
LLDPE	Singapore	Prime Evolue Singapore	Jurong Island	0	0	0	0	0	0	0	0	300	300
LLDPE	Thailand	PTT Global Chemical	Map Ta Phut	0	0	0	0	0	0	0	0	0	0
LLDPE	Thailand	PTT Polyethylene	Map Ta Phut	0	0	0	400	400	400	400	400	400	400
LLDPE	Thailand	Siam Polyethylene	Map Ta Phut	300	300	300	300	300	300	300	300	300	300
LLDPE	Thailand	Siam Polyethylene	Map Ta Phut	0	0	0	350	350	350	350	350	350	350
LLDPE	Thailand	Siam Polyethylene	Map Ta Phut	0	0	0	0	220	220	220	220	220	220
LLDPE	Thailand	Thai Polyethylene	Map Ta Phut	120	120	120	120	120	120	120	120	120	120
LLDPE	Vietnam	Long Son Petrochemical	Long Son	0	0	0	0	0	0	0	0	0	0
LDPE	Malaysia	Lotte Chemical Titan	Tanjung Langsat	230	230	230	230	230	230	230	230	230	230
LDPE	Malaysia	Petlin	Kerteh	255	255	255	255	255	255	255	255	255	255
LDPE	Singapore	The Polyolefin Company	Jurong Island	75	75	75	75	75	75	75	75	75	75
LDPE	Singapore	The Polyolefin Company	Jurong Island	180	180	180	180	180	180	180	180	180	180
LDPE	Thailand	PTT Polyethylene	Map Ta Phut	0	0	0	300	300	300	300	300	300	300
LDPE	Thailand	Thai Polyethylene	Map Ta Phut	100	100	100	100	100	100	100	100	100	100
LDPE	Thailand	TPIPL	Rayong	85	85	85	85	85	85	85	85	85	85
LDPE	Thailand	TPIPL	Rayong	65	65	65	65	65	65	65	65	65	65

Product	Country	Company	Location	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Butadiene	Indonesia	PT Petrokimia Butadiene	Anyer	100	100	100	100	100	100	100	100	100	100	100
Butadiene	Malaysia	Honam Petrochemical	Pasir Gudang	100	100	100	100	100	100	100	100	100	100	100
Butadiene	Malaysia	Petronas	Pengerang	0	0	0	192	192	192	192	192	192	192	192
Butadiene	Philippines	JG Summit Petrochemical	Batangas	0	0	90	90	90	90	90	90	90	90	90
Butadiene	Singapore	PCS Singapore	Jurong Island	60	60	60	60	60	60	60	60	60	60	60
Butadiene	Singapore	PCS Singapore	Jurong Island	100	100	100	100	100	100	100	100	100	100	100
Butadiene	Singapore	Shell	Pulau Bukom	155	155	155	155	155	155	155	155	155	155	155
Butadiene	Thailand	Bangkok Synthetics Co (BST)	Map Ta Phut	140	140	140	140	140	140	140	140	140	140	140
Butadiene	Thailand	IRPC	Rayong	50	50	50	50	50	50	50	50	50	50	50
Butadiene	Thailand	PTT Global Chemical	Map Ta Phut	75	75	75	75	75	75	75	75	75	75	75
Butadiene	Vietnam	Long Son Petrochemical	Long Son	0	0	0	80	80	80	80	80	80	80	80
HDPE	Indonesia	Chandra Asri Petrochemical	Anyer	140	140	140	140	140	140	140	140	140	140	140
HDPE	Indonesia	Lotte Chemical Titan	Merak, West Java	250	250	250	250	250	250	250	250	250	250	250
HDPE	Malaysia	Lotte Chemical Titan	Tanjung Langsat	115	115	115	115	115	115	115	115	115	115	115
HDPE	Malaysia	Lotte Chemical Titan	Pasir Gudang	220	220	220	220	220	220	220	220	220	220	220
HDPE	Malaysia	Petronas	Pengerang	0	0	0	400	400	400	400	400	400	400	400
HDPE	Malaysia	Polyethylene Malaysia	Kerteh	180	180	180	180	180	180	180	180	180	180	180
HDPE	Singapore	Chevron Phillips	Jurong Island	190	190	190	190	190	190	190	190	190	190	190
HDPE	Singapore	Chevron Phillips	Jurong Island	215	215	215	215	215	215	215	215	215	215	215
HDPE	Thailand	Bangkok Polyethylene	Map Ta Phut	250	250	250	250	250	250	250	250	250	250	250
HDPE	Thailand	Bangkok Polyethylene	Map Ta Phut	250	250	250	250	250	250	250	250	250	250	250
HDPE	Thailand	IRPC	Rayong	140	140	140	140	140	140	140	140	140	140	140
HDPE	Thailand	PTT Global Chemical	Map Ta Phut	300	300	300	300	300	300	300	300	300	300	300
HDPE	Thailand	Thai Polyethylene	Map Ta Phut	160	160	160	160	160	160	160	160	160	160	160
HDPE	Thailand	Thai Polyethylene	Map Ta Phut	180	180	180	180	180	180	180	180	180	180	180
HDPE	Thailand	Thai Polyethylene	Map Ta Phut	240	240	240	240	240	240	240	240	240	240	240
HDPE	Thailand	Thai Polyethylene	Map Ta Phut	400	400	400	400	400	400	400	400	400	400	400
HDPE	Vietnam	Long Son Petrochemical	Long Son	0	0	0	450	450	450	450	450	450	450	450
LLDPE	Indonesia	Chandra Asri Petrochemical	Anyer	200	200	200	200	200	200	200	200	200	200	200
LLDPE	Indonesia	Lotte Chemical Titan	Merak, West Java	200	200	200	200	200	200	200	200	200	200	200
LLDPE	Indonesia	PT Titan	Merak, West Java	0	0	0	0	0	0	0	0	0	0	0
LLDPE	Malaysia	Petronas	Pengerang	0	0	0	350	350	350	350	350	350	350	350
LLDPE	Malaysia	Polyethylene Malaysia	Kerteh	70	70	70	70	70	70	70	70	70	70	70
LLDPE	Philippines	JG Summit Petrochemical	Batangas	320	320	320	320	320	320	320	320	320	320	320
LLDPE	Philippines	NPC Alliance	Bataan	250	250	250	250	250	250	250	250	250	250	250
LLDPE	Singapore	ExxonMobil	Jurong Island	300	300	300	300	300	300	300	300	300	300	300
LLDPE	Singapore	ExxonMobil	Jurong Island	600	600	600	600	600	600	600	600	600	600	600
LLDPE	Singapore	ExxonMobil	Jurong Island	650	650	650	650	650	650	650	650	650	650	650
LLDPE	Singapore	ExxonMobil	Jurong Island	650	650	650	650	650	650	650	650	650	650	650
LLDPE	Singapore	Prime Evolue Singapore	Jurong Island	300	300	300	300	300	300	300	300	300	300	300
LLDPE	Thailand	PTT Global Chemical	Map Ta Phut	0	400	400	400	400	400	400	400	400	400	400
LLDPE	Thailand	PTT Polyethylene	Map Ta Phut	400	400	400	400	400	400	400	400	400	400	400
LLDPE	Thailand	Siam Polyethylene	Map Ta Phut	300	300	300	300	300	300	300	300	300	300	300
LLDPE	Thailand	Siam Polyethylene	Map Ta Phut	350	350	350	350	350	350	350	350	350	350	350
LLDPE	Thailand	Siam Polyethylene	Map Ta Phut	220	220	220	220	220	220	220	220	220	220	220
LLDPE	Thailand	Thai Polyethylene	Map Ta Phut	120	120	120	120	120	120	120	120	120	120	120
LLDPE	Vietnam	Long Son Petrochemical	Long Son	0	0	0	450	450	450	450	450	450	450	450
LDPE	Malaysia	Lotte Chemical Titan	Tanjung Langsat	230	230	230	230	230	230	230	230	230	230	230
LDPE	Malaysia	Petlin	Kerteh	255	255	255	255	255	255	255	255	255	255	255
LDPE	Singapore	The Polyolefin Company	Jurong Island	75	75	75	75	75	75	75	75	75	75	75
LDPE	Singapore	The Polyolefin Company	Jurong Island	180	180	180	180	180	180	180	180	180	180	180
LDPE	Thailand	PTT Polyethylene	Map Ta Phut	300	300	300	300	300	300	300	300	300	300	300
LDPE	Thailand	Thai Polyethylene	Map Ta Phut	100	152	152	152	152	152	152	152	152	152	152
LDPE	Thailand	TPIPL	Rayong	85	85	85	85	85	85	85	85	85	85	85
LDPE	Thailand	TPIPL	Rayong	65	65	65	65	65	65	65	65	65	65	65

Product	Country	Company	Location	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
PP	Indonesia	Chandra Asri Petrochemical	Anyer	260	260	260	260	320	320	320	320	320	320
PP	Indonesia	Chandra Asri Petrochemical	Anyer	120	120	120	120	160	160	160	160	160	160
PP	Indonesia	Pertamina	Pladju	45	45	45	45	45	45	45	45	45	45
PP	Indonesia	Polytama Propindo	Balongan	60	60	60	60	60	60	60	60	60	60
PP	Indonesia	Polytama Propindo	Balongan	180	180	180	180	180	180	180	180	180	180
PP	Malaysia	Lotte Chemical Titan	Pasir Gudang	150	150	150	150	150	150	150	150	150	166
PP	Malaysia	Lotte Chemical Titan	Pasir Gudang	240	240	240	240	240	240	240	240	240	274
PP	Malaysia	Petronas	Pengerang	0	0	0	0	0	0	0	0	0	0
PP	Malaysia	Petronas	Pengerang	0	0	0	0	0	0	0	0	0	0
PP	Malaysia	PP Malaysia	Kuantan	80	80	80	80	80	80	0	0	0	0
PP	Philippines	JG Summit Petrochemical	Batangas	180	180	180	180	180	180	180	180	180	180
PP	Philippines	Philippine Polypropylene Inc.	Bataan	0	0	0	160	160	160	160	160	160	160
PP	Singapore	ExxonMobil	Jurong Island	0	0	0	0	0	450	450	450	450	450
PP	Singapore	ExxonMobil	Jurong Island	405	405	405	405	405	405	405	405	405	405
PP	Singapore	The Polyolefin Company	Jurong Island	155	155	155	155	170	170	170	170	170	170
PP	Singapore	The Polyolefin Company	Jurong Island	200	200	200	200	200	200	200	200	200	200
PP	Singapore	The Polyolefin Company	Jurong Island	200	200	200	200	240	240	240	240	240	240
PP	Singapore	The Polyolefin Company	Jurong Island	55	55	55	55	70	70	70	70	70	70
PP	Thailand	HMC Polymers	Map Ta Phut	240	240	240	240	240	240	240	240	240	240
PP	Thailand	HMC Polymers	Map Ta Phut	210	210	210	210	210	210	210	210	210	210
PP	Thailand	HMC Polymers	Map Ta Phut	0	0	0	300	300	300	300	300	300	300
PP	Thailand	IRPC	Rayong	0	0	0	0	0	0	0	0	0	0
PP	Thailand	IRPC	Rayong	120	120	120	120	120	120	120	120	120	120
PP	Thailand	IRPC	Rayong	225	225	225	225	225	225	225	225	225	225
PP	Thailand	IRPC	Rayong	130	130	130	130	130	130	130	130	130	130
PP	Thailand	Thai Polypropylene	Map Ta Phut	160	160	160	160	160	160	160	160	160	160
PP	Thailand	Thai Polypropylene	Map Ta Phut	180	180	180	180	180	180	180	180	180	180
PP	Thailand	Thai Polypropylene	Map Ta Phut	0	0	0	400	400	400	400	400	400	400
PP	Vietnam	Long Son Petrochemical	Long Son	0	0	0	0	0	0	0	0	0	0
PP	Vietnam	NSRP	Nghi Son	0	0	0	0	0	0	0	0	0	0
PP	Vietnam	PetroVietnam	Dung Quat	0	0	0	150	150	150	150	150	150	150
Benzene	Indonesia	Pertamina	Cilacap	96	96	96	96	96	96	96	96	96	96
Benzene	Indonesia	Pertamina	Cilacap	29	29	29	29	29	29	29	29	29	29
Benzene	Indonesia	TPPI	Tuban	220	220	220	220	220	220	220	220	220	220
Benzene	Indonesia	TPPI	Tuban	180	180	180	180	180	180	180	180	180	180
Benzene	Malaysia	Aromatics Malaysia	Kerteh	130	130	130	130	130	130	130	130	130	130
Benzene	Malaysia	Aromatics Malaysia	Kerteh	49	49	49	49	49	49	49	49	49	49
Benzene	Malaysia	Lotte Chemical Titan	Pasir Gudang	106	106	106	106	106	106	106	106	106	106
Benzene	Malaysia	Petronas	Pengerang	0	0	0	0	0	0	0	0	0	0
Benzene	Philippines	JG Summit	Batangas	0	0	0	0	0	0	0	0	0	0
Benzene	Philippines	Petron	Bataan	0	0	23	23	23	23	23	23	23	23
Benzene	Singapore	ExxonMobil	Jurong	120	120	120	120	120	120	120	120	120	120
Benzene	Singapore	ExxonMobil	Jurong Island	0	0	0	0	0	0	340	340	340	340
Benzene	Singapore	ExxonMobil	Jurong	300	300	300	300	300	300	300	300	300	300
Benzene	Singapore	ExxonMobil	Jurong	0	0	0	0	0	0	75	75	75	75
Benzene	Singapore	Jurong Aromatics	Jurong Island	0	0	0	0	0	0	0	450	450	450
Benzene	Singapore	PCS Singapore	Jurong Island	270	270	270	270	270	270	270	270	270	270
Benzene	Singapore	Shell	Pulau Bukom	0	0	0	230	230	230	230	230	230	288
Benzene	Singapore	Singapore Aromatics	Jurong Island	60	60	60	60	60	60	60	60	60	60
Benzene	Singapore	Singapore Aromatics	Jurong Island	29	29	29	29	29	29	29	29	29	29
Benzene	Thailand	ExxonMobil	Sriracha	70	70	70	70	70	70	70	70	70	70
Benzene	Thailand	IRPC	Rayong	110	110	110	110	110	110	110	110	110	110
Benzene	Thailand	Map Ta Phut Olefins	Map Ta Phut	0	0	0	172	172	172	172	172	172	172
Benzene	Thailand	PTT Global Chemical	Map Ta Phut	0	363	363	363	363	363	363	363	363	390
Benzene	Thailand	PTT Global Chemical	Map Ta Phut	84	84	84	84	84	84	84	84	84	84
Benzene	Thailand	PTT Global Chemical	Map Ta Phut	137	137	137	137	137	137	137	137	137	137
Benzene	Thailand	PTT Global Chemical	Map Ta Phut	209	209	209	209	209	209	209	209	209	209
Benzene	Thailand	Rayong Olefins	Map Ta Phut	160	160	160	160	160	160	160	160	160	160
Benzene	Thailand	Thai Oil	Sriracha	0	140	140	140	140	140	140	140	140	140
Benzene	Thailand	Thai Paraxylene	Sriracha	0	0	0	0	0	125	125	125	125	125
Benzene	Thailand	Thai Paraxylene	Sriracha	0	40	40	40	40	40	0	0	0	0
Benzene	Vietnam	NSRP	Nghi Son	0	0	0	0	0	0	0	0	0	0

Product	Country	Company	Location	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
PP	Indonesia	Chandra Asri Petrochemical	Anyer	320	320	320	320	320	320	320	320	320	320	320
PP	Indonesia	Chandra Asri Petrochemical	Anyer	160	160	160	160	160	160	160	160	160	160	160
PP	Indonesia	Pertamina	Pladju	45	45	45	45	45	45	45	45	45	45	45
PP	Indonesia	Polytama Propindo	Balongan	60	60	60	60	60	60	60	60	60	60	60
PP	Indonesia	Polytama Propindo	Balongan	180	180	180	180	180	180	180	180	180	180	180
PP	Malaysia	Lotte Chemical Titan	Pasir Gudang	166	166	166	166	166	166	166	166	166	166	166
PP	Malaysia	Lotte Chemical Titan	Pasir Gudang	274	474	474	474	474	474	474	474	474	474	474
PP	Malaysia	Petronas	Pengerang	0	0	0	450	450	450	450	450	450	450	450
PP	Malaysia	Petronas	Pengerang	0	0	0	450	450	450	450	450	450	450	450
PP	Malaysia	PP Malaysia	Kuantan	0	0	0	0	0	0	0	0	0	0	0
PP	Philippines	JG Summit Petrochemical	Batangas	180	180	180	180	180	180	180	180	180	180	180
PP	Philippines	Philippine Polypropylene Inc.	Bataan	160	160	160	160	160	160	160	160	160	160	160
PP	Singapore	ExxonMobil	Jurong Island	450	450	450	450	450	450	450	450	450	450	450
PP	Singapore	ExxonMobil	Jurong Island	405	405	405	405	405	405	405	405	405	405	405
PP	Singapore	The Polyolefin Company	Jurong Island	170	170	170	170	170	170	170	170	170	170	170
PP	Singapore	The Polyolefin Company	Jurong Island	200	200	200	200	200	200	200	200	200	200	200
PP	Singapore	The Polyolefin Company	Jurong Island	240	240	240	240	240	240	240	240	240	240	240
PP	Singapore	The Polyolefin Company	Jurong Island	70	70	70	70	70	70	70	70	70	70	70
PP	Thailand	HMC Polymers	Map Ta Phut	240	240	240	240	240	240	240	240	240	240	240
PP	Thailand	HMC Polymers	Map Ta Phut	210	210	210	210	210	210	210	210	210	210	210
PP	Thailand	HMC Polymers	Map Ta Phut	300	300	300	300	300	300	300	300	300	300	300
PP	Thailand	IRPC	Rayong	140	140	140	140	140	140	140	140	140	140	140
PP	Thailand	IRPC	Rayong	120	120	120	120	120	120	120	120	120	120	120
PP	Thailand	IRPC	Rayong	385	385	385	385	385	385	385	385	385	385	385
PP	Thailand	IRPC	Rayong	130	130	130	130	130	130	130	130	130	130	130
PP	Thailand	Thai Polypropylene	Map Ta Phut	160	160	160	160	160	160	160	160	160	160	160
PP	Thailand	Thai Polypropylene	Map Ta Phut	180	180	180	180	180	180	180	180	180	180	180
PP	Thailand	Thai Polypropylene	Map Ta Phut	400	400	400	400	400	400	400	400	400	400	400
PP	Vietnam	Long Son Petrochemical	Long Son	0	0	0	500	500	500	500	500	500	500	500
PP	Vietnam	NSRP	Nghi Son	400	400	400	400	400	400	400	400	400	400	400
PP	Vietnam	PetroVietnam	Dung Quat	150	150	150	150	150	150	150	150	150	150	150
Benzene	Indonesia	Pertamina	Cilacap	96	96	96	96	96	96	96	96	96	96	96
Benzene	Indonesia	Pertamina	Cilacap	29	29	29	29	29	29	29	29	29	29	29
Benzene	Indonesia	TPPI	Tuban	220	220	220	220	220	220	220	220	220	220	220
Benzene	Indonesia	TPPI	Tuban	180	180	180	180	180	180	180	180	180	180	180
Benzene	Malaysia	Aromatics Malaysia	Kerteh	130	130	130	130	130	130	130	130	130	130	130
Benzene	Malaysia	Aromatics Malaysia	Kerteh	49	49	49	49	49	49	49	49	49	49	49
Benzene	Malaysia	Lotte Chemical Titan	Pasir Gudang	240	240	240	240	240	240	240	240	240	240	240
Benzene	Malaysia	Petronas	Pengerang	0	0	300	300	300	300	300	300	300	300	300
Benzene	Philippines	JG Summit	Batangas	0	0	98	98	98	98	98	98	98	98	98
Benzene	Philippines	Petron	Bataan	23	23	23	23	23	23	23	23	23	23	23
Benzene	Singapore	ExxonMobil	Jurong	120	120	120	120	120	120	120	120	120	120	120
Benzene	Singapore	ExxonMobil	Jurong Island	340	340	340	340	340	340	340	340	340	340	340
Benzene	Singapore	ExxonMobil	Jurong	300	300	300	300	300	300	300	300	300	300	300
Benzene	Singapore	ExxonMobil	Jurong	75	75	75	75	75	75	75	75	75	75	75
Benzene	Singapore	Jurong Aromatics	Jurong Island	450	450	450	450	450	450	450	450	450	450	450
Benzene	Singapore	PCS Singapore	Jurong Island	270	270	270	270	270	270	270	270	270	270	270
Benzene	Singapore	Shell	Pulau Bukom	288	288	288	288	288	288	288	288	288	288	288
Benzene	Singapore	Singapore Aromatics	Jurong Island	60	60	60	60	60	60	60	60	60	60	60
Benzene	Singapore	Singapore Aromatics	Jurong Island	29	29	29	29	29	29	29	29	29	29	29
Benzene	Thailand	ExxonMobil	Sriracha	70	70	70	70	70	70	70	70	70	70	70
Benzene	Thailand	IRPC	Rayong	110	110	110	110	110	110	110	110	110	110	110
Benzene	Thailand	Map Ta Phut Olefins	Map Ta Phut	172	172	172	172	172	172	172	172	172	172	172
Benzene	Thailand	PTT Global Chemical	Map Ta Phut	390	390	390	390	390	390	390	390	390	390	390
Benzene	Thailand	PTT Global Chemical	Map Ta Phut	84	84	84	84	84	84	84	84	84	84	84
Benzene	Thailand	PTT Global Chemical	Map Ta Phut	137	137	137	137	137	137	137	137	137	137	137
Benzene	Thailand	PTT Global Chemical	Map Ta Phut	209	209	209	209	209	209	209	209	209	209	209
Benzene	Thailand	Rayong Olefins	Map Ta Phut	160	160	160	160	160	160	160	160	160	160	160
Benzene	Thailand	Thai Oil	Sriracha	140	140	140	140	140	140	140	140	140	140	140
Benzene	Thailand	Thai Paraxylene	Sriracha	125	125	125	125	125	125	125	125	125	125	125
Benzene	Thailand	Thai Paraxylene	Sriracha	0	0	0	0	0	0	0	0	0	0	0
Benzene	Vietnam	NSRP	Nghi Son	0	240	240	240	240	240	240	240	240	240	240

Asia and China Net Imports

	2016
Asia Pacific	Net Imports
Propylene	605
Ethylene	1 189
LLDPE	1 760
PP	1 910
LDPE	2 266
ParaXylene	2 880
Styrene	3 123
HDPE	4 549
Ethylene Glycol	7 338

China	Net Import
Ethylene	1 211
Propylene	1 992
LDPE	2 593
LLDPE	2 850
PP	3 168
Styrene	3 998
HDPE	5 148
Ethylene Glycol	7 197
ParaXylene	12 676

A.3 PRICES

NEXANT DATA - LONG TERM CRUDE OIL SCENARIO OF US$70 PER BBL	2007	2008	2009	2010	2011	2012	2013	2014	2015
Current (nominal) Prices, US$ per ton									
Brent Crude ($ per bbl)	72.6	97.1	61.6	79.8	111.4	111.7	108.7	99.2	52.8
MOPJ	695.9	826.5	553.4	723.9	938.2	943.1	921.5	861.4	490.7
Regional SEA									
Ethylene	1180.4	1126.5	872.6	1075.2	1167.9	1221.4	1353.9	1400.2	1101.9
Propylene	1148.0	1247.3	949.0	1190.7	1357.8	1284.8	1348.3	1240.5	787.7
LDPE	1454.9	1590.9	1180.9	1477.6	1575.6	1339.0	1521.1	1567.9	1253.8
LLDPE	1345.3	1492.6	1157.2	1299.9	1328.3	1326.8	1472.7	1546.8	1223.8
HDPE	1328.2	1430.8	1121.6	1223.9	1354.1	1353.3	1467.2	1522.5	1231.9
PP	1326.0	1457.2	1065.8	1310.3	1533.1	1400.7	1487.3	1498.3	1108.6
Butadiene	1072.5	2034.8	1027.6	1907.9	2936.9	2445.5	1480.3	1281.0	887.8
Benzene	1004.4	954.7	702.4	928.1	1125.2	1218.5	1313.9	1221.3	697.6
Inflator	*0.87*	*0.89*	*0.90*	*0.91*	*0.93*	*0.94*	*0.96*	*0.98*	*0.99*

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
44.1	56.1	67.6	74.3	75.8	77.3	78.8	80.4	82.0	83.7	85.3	87.0
398.4	522.3	612.4	669.0	683.9	696.8	710.0	723.7	737.6	751.1	765.7	780.7
1045.3	1183.6	1229.9	1165.3	1093.8	1082.6	1111.5	1147.0	1219.9	1364.9	1283.6	1239.0
722.3	876.7	971.9	985.7	965.4	985.9	1024.9	1081.7	1180.2	1330.1	1249.1	1198.9
1192.4	1301.7	1397.4	1418.0	1377.4	1374.4	1393.8	1427.3	1487.4	1602.2	1619.4	1602.4
1151.7	1278.4	1361.1	1372.1	1323.6	1317.7	1334.2	1364.2	1422.1	1539.6	1540.1	1512.7
1138.8	1275.1	1351.8	1356.7	1304.7	1299.2	1318.9	1351.3	1414.0	1540.1	1530.0	1496.8
981.8	1113.2	1211.1	1240.7	1221.9	1229.7	1256.5	1302.0	1378.9	1513.8	1490.9	1461.5
1127.2	1126.9	1294.8	1415.3	1416.2	1409.0	1450.8	1506.5	1603.3	1705.1	1744.9	1742.2
645.5	762.5	852.7	907.9	929.9	931.3	969.2	1026.7	1127.9	1217.9	1185.6	1121.4
1.00	*1.02*	*1.04*	*1.06*	*1.08*	*1.10*	*1.13*	*1.15*	*1.17*	*1.20*	*1.22*	*1.24*

A.4 GLOSSARY

Term	Description
ABS	Acrylonitrile butadiene styrene is widely used in automotive applications, housings for electrical appliances and various household products
Alkylate	Alkylate is a key component in cleaner burning gasoline
Ammonia	A nitrogen and hydrogen compound in the form of colourless gas with a characteristic pungent odour.
ASEAN	Association of Southeast Asian Nations.
Aromatics	A family of hydrocarbons characterised by a single or multiple ring structure. The most commonly traded are benzene, toluene, and xylenes.
Benzene	The simplest aromatic hydrocarbons (C6H6). Each carbon in the ring has a hydrogen attached. It is a volatile inflammable liquid created by catalytically reforming naphtha, in the thermal cracking process, and is used in production of other chemicals such as styrene, cumene, cyclohexane and maleic anhydride.
BTX	Benzene, Toluene, and Xylenes
Butadiene	Butadiene is a feedstock for the production of a wide variety of synthetic rubbers and polymer resins
Butadiene Rubber	Synthetic rubber widely employed in tire treads for automobiles, made from the polymerisation of butadiene
Butane	A gas which liquefies with a relatively small increase in pressure or decrease in temperature. Used for heating, as a petrochemical industry feedstock and as an additive in petrol to enhance its vapour pressure.
Butanol	Chemical intermediate (colourless flammable liquid). It is used to produce other chemicals, as an ingredient in formulated products such as cosmetics, coatings, adhesives and as a solvent.
Butene-1	An organic chemical base, derived from cracking of petroleum or C4 distillate, and used mainly to produce butadiene and butanol.
Butyl acrylate	Butyl acrylate is colourless liquid, produced from the esterification of crude acrylic acid and butanol. It is used in the production of coatings and inks, adhesives, sealants, textiles, plastics and elastomers.
C1	monomer with one carbon molecule e.g. methane, methanol, ammonia
C2	monomer with two carbon molecules, e.g. ethane and ethylene
C3	monomer with three carbon molecules, e.g. propane, propylene
C4	monomer with four carbon molecules, e.g. butane, butadiene
C6	monomer with six carbon molecules e.g. benzene, styrene
Cash Margin	The difference between the price and the cash cost of production
Cash Cost	Cost of producing a product, accounting for raw materials, co-products, utilty costs, labour, maintenance and other plant fixed costs.
CAGR	Compound annual growth rate.
Capacity utilisation	The total production (including off-specifications products) expressed as a percentage of nameplate capacity, adjusted for plant debottlenecking, scheduled turnaround and scheduled maintenance during the year.
Cash Cost	Cost of producing a product which factors in raw material costs,
CFR	Cost and freight. The delivery of goods to the named port of destination (discharge) at the seller's expense. Buyer is responsible for the cargo insurance and other costs and risks.

Cracking	A refining process which breaks down large molecules of oil into smaller molecules. When the process is achieved by applying heat only, it is known as thermal cracking. Cracking uses molecular decomposition and recombination to produce a range of more useful base chemicals suitable for motor oils or petrochemicals.
Crude Oil	Naturally occurring liquid fossil fuel resulting from plants and animals buried underground and exposed to extreme heat and pressure.
Debottlenecking	Increasing production capacity of existing facilities through the modification of existing equipment to remove throughput restrictions.
Downstream	Refining activities, and/or further processing of a chemical to produce a produce or derivative in a petrochemical value chain.
Ethane	A gaseous hydrocarbon, it is a major constituent of natural gas and a major raw material for the ethylene petrochemical industry.
Ethylbenzene	An aromatic liquid hydrocarbon, is a chemical intermediate made from the reaction of benzene and ethylene. It is a precursor to styrene production.
Ethylene	An essential organic chemical base derived from the thermal cracking of ethane and naphtha or from the dehydration of ethanol. It is used to make polyester and many organic chemical intermediates, such as polyethylene, ethylene oxide, ethylene glycol, vinyl chloride, styrene, acetaldehyde and ethanol.
Ethylene glycol	An organic chemical compound, derived from the oxidation of ethylene. Includes monoethylene glycol, diethylene glycol, triethylene glycol and polyethylene glycol.
Ethylene oxide	A highly reactive chemical intermediate used in the production of ethylene glycol and other oxide derivatives such as glycol ethers, polyethylene glycol, polyether polyols, diethylene and triethylene glycols and ethanolamines.
EPS	Expandable polystyrene is a form of polystyrene with a propellant such as pentane dissolved in it. Its largest use is in the production of foam boards for buildings insulation, and it is widely used to create moulded shapes for packaging fragile goods, such as TV sets, and in foam cups for hot drinks
EVA	Ethylene vinyl acetate is mainly used in moulded foam (largely shoes), film and adhesives
Feedstock	Raw materials used in a processing plant, of which naphtha and ethane are the most important for the olefins industry.
FOB	Free on board. The delivery of goods on board the vessel at the named port of origin (loading), at seller's expense. Buyer is responsible for the main carriage/freight, cargo insurance and other costs and risks.
Fuel Oil	A flammable liquid hydrocarbon with a chemical formula of C9+. Normally it is used as a fuel for plant boilers and ship bunkers. It can also be used to make carbon black material.
GDP	Gross domestic product
HDPE	High density polyethylene, used for tubes, pipes, household containers, grocery bags, water coolers, milk bottles and other products.
HMDA	Hexamethylenediamine is used almost exclusively for the production of nylon 6,6
Hydrocarbons	Substances composed of carbon and hydrogen.
KM	Kilometres
KT	Thousands of metric tons.
KTA	Thousands of metric tons per annum.
LDPE	Low density polyethylene, used for films, tubes, mechanical parts, toys, electric wire insulation and other products.

LLDPE	Linear low density polyethylene. LLDPE is commonly used in film applications for packaging and other products.
LPG	Liquefied petroleum gas, primarily propane and butane produced at refineries or natural gas processing plants.
MEG	Mono ethylene glycol (also referred to as EG) is the main constituent of anti-freeze, although consumption of MEG in the production of polyester has now overtaken this as the main end use, and MEG is therefore classed as a polyester intermediate. MEG is produced by the reaction of ethylene oxide and water, and most modern plants are combined EO/MEG units.
Metallocene	A catalyst employed in polyetheylene production to improve polymer performance such as mechanical strength, sealability and optical properties.
Methane	A light, colourless gas which is the principal component in natural gas.
Methanol	Simplest organic alcohol and is a colourless, flammable liquid. While originally produced from wood or coal, today methanol is produced mainly using methane as feedstock.
Metathesis	Metathesis is an equilibrium and reversible reaction between two olefins where the double bond of each is broken and new olefins are formed the exchange of parts of the reactants.
Monomers	Small molecules that may become chemically bonded to other monomers to form a polymer.
MOPJ	Means of-Platts CFR Japan which shows daily price assessment of CFR Japan open specification naphtha market.
MT	Metric ton or "ton" is equal to 1,000 kilograms, or 2,204.6 pounds.
MTBE	Methyl tertiary butyl ether is a volatile, combustible, colourless liquid that is categorised as an oxygenate due to its ability to boost the oxygen content and octane rating of gasoline. It is relatively water soluble and exhibits an unpleasant taste and odour in solution.
MTO, MTP	Metanol-to-Olefins, Metanol-to-Propylene. MTO and MTP are relatively new technologies but typically provide a route from natural gas or coal to olefins
MW	Megawatt (one million Watts), a measure of electrical power.
Nameplate capacity	The capacity of a production facility based on technology licenses and/or production rates guaranteed by the construction contractor.
Naphtha	A general term used for low boiling hydrocarbon fractions that are a product of crude oil or condensate refining. Naphtha is used as feedstock for ethylene and propylene production.
Natural gas	A colourless gas, high flammable gaseous hydrocarbon consisting primarily of methane, ethane, and small amounts of heavier gaseous hydrocarbon compounds such as propane.
n-butane	A gas in the LPG family of petroleum gases that can be separated from the gas stream that is often associated with crude oil as it leaves an oil well. Butane is a four carbon hydrocarbon that can either be arranged as a straight chain (n-butane) or branched (iso-butane). Butane extracted from associated gas is most usually a mixture of these two isomers. N-Butane is more highly valued as a petrochemical feedstock as it yields more ethylene in a steam cracker.
Olefins	A straight or branched-chain hydrocarbon with at least one unsaturated and carbon-carbon bond. Produced by cracking feedstock from raw materials such as natural gas and crude oil. The main olefins are ethylene and propylene and also include butadiene and C4 derivatives.
OPEC	The Organization of the Petroleum Exporting Countries
Operating rate	Total production expressed as a percentage of nameplate capacity.

Para-Xylene	An aromatic compound with two methyl groups substituted onto the benzene ring at opposite positions. Para-xylene is recovered from a mixed xylenes stream by adsorption and by isomerisation of C_8 aromatics. It is a major raw material for polyester production.
PDH	Propane dehydrogenation
PE	Polyethylene.
Performance chemicals	Chemicals produced in order to improve performance, increase efficiency and enhance features that benefit multiple industrial sectors.
Petrochemicals	Chemicals derived from petroleum or natural gas
Polyester	Type of polymer that contains an ester functional group in their main chain. As a specific material, it most commonly refers to a type called polyethylene terephthalate (PET), and is primarily use in the production of plastic bottles or textile fibre.
Polyethylene	A polymer, derived from polymerisation of ethylene, and used to make various plastics such as film and sheet, piping and containers. Polyethylene is generally categorized into three sectors including HDPE, LLDPE and LDPE.
Polymer	When certain individual molecules (monomers) come together and link up in a chain-like fashion they form a polymer. The chemical reaction that forms a polymer is called polymerisation.
Polyolefins	Hydrocarbons resulting from the chemical combination of olefins or olefins and other polyolefins.
Propane	A gaseous hydrocarbon (C3H8), it is a major constituent of natural gas and a major raw material for the production of propylene.
Polypropylene	A polymer, derived from polymerisation of propylene. It is used to make packaging materials, toys, mechanical parts, housewares, synthetic fibres and other products.
Polystyrene	Polystyrene (PS) is a commodity polymer with a broad range of end-uses. There are two main types of polystyrene: general purpose (GPPS), and high impact (HIPS). HIPS contains a small proportion of butadiene rubber, giving it higher strength and better impact resistance. GPPS is normally used in the transparent or "crystal" form, or foamed
Propylene	An organic chemical base, which is a colourless, flammable, gaseous hydrocarbon obtained from the thermal cracking of hydrocarbons, ranging from natural gas liquids (ethane, propane and butane) to petroleum liquids (naphtha and gas oils). It is used to make polypropylene, acrylonitrile, propanoic acid ester, phenol, acetone, synthetic petroleum, synthetic resins, synthetic rubber and synthetic fibres.
PTA	Purified terephthalic acid is primarily used in polyester production with polyester fibre
PVC	Polyvinyl chloride. A versatile polymer, produced from VCM, is extensively used in construction sector including pipe, siding and window/door profiles, wire and cable insulation, rigid film/sheet, and flooring.
Pygas	Pyrolysis gasoline, a naphtha-range product with a high aromatics content, used in the production of benzene, toluene and mixed xylenes and as a motor vehicle gas blending stock.
Refining	The conversion of crude oil into useful products, such as naphtha, the most important feedstock for the petrochemical industry. The general refinery process begins with the separation of crude oil into different fractions by distillation. The fractions are further treated to convert them into mixtures of more useful products by various methods such as cracking, reforming, alkylation, polymerisation and isomerisation. These mixtures of new compounds are then separated using methods such as fractionation and solvent extraction.
Reformate	Reformate is the main source of aromatic bulk chemicals such as benzene, toluene, xylene and ethylbenzene which have diverse uses, most importantly as raw materials for conversion into plastics
R&D	Research and development

Resin	Any natural or synthetic organic compound consisting of a non-crystalline or viscous liquid substance. Natural resins are organic substances that are transparent or translucent, formed in plant secretions. Synthetic resins comprise a large class of synthetic products that have some of the physical properties of natural resins but are different chemically. Most synthetic resins are polymers.
SB Rubber or SBR	Styrene butadiene rubber (SBR) is the largest volume synthetic rubber, and its uses are dominated to a great extent by the automotive industry, particularly tyre production
SEA CFR	A standard price for various olefins and petrochemical products which includes the cost of the product and of shipment. Southeast Asia-based price cost and freight.
Specialty chemicals	Chemicals produced in small volume, having higher unit values and used for critical applications requiring stringent performance criteria.
Styrene	A colourless liquid that is a chemical intermediate made from dehydrogenation of ethylbenzene and a vinyl group on styrene molecule can readily undergo polymerisation. It is used in the production of variety of polymers and rubbers including polystyrene, ABS, SBR, SBL and unsaturated polyesters.
Thermal cracking	A petroleum refining process used to break up heavy oil molecules into lighter, more valuable fractions (e.g., gasoline or kerosene) by the use of high temperature without the aid of catalysts. It is used to convert gas oils into naphtha.
Toluene	Benzene rings where one of the hydrogen atoms is replaced by a methyl group (-CH3). It is used as an octane enhancer in gasoline, as a chemical intermediate in the production of benzene, paraxylene, toluene diisocyanate and as a solvent in paints.
Ton	Ton or "metric ton" is equal to 1,000 kilograms, or 2,204.6 pounds.
Upstream	Oil and gas activities including gas and oil extraction and storage
Urea	A fertiliser with a minimum nitrogen content of approximately 46% by weight.
US$ per ton	U.S. dollars per ton
Utilisation rate	Total production expressed as a percentage of nameplate capacity.
VAM	Vinyl acetate monomer is a highly verstaile and important intermediates used in the production of a variety of polymers (e.g. polyvinyl acetate, polyvinyl alcohol, polyvinyl butyral and polyvinyl formal)
VCM	Vinyl chloride monomer is an intermediate chemical of the vinyls chain, mainly produced by thermal cracking of EDC. Almost all VCM produced is used to manufacture PVC, with other applications consuming very little VCM.
Xylene	Xylene is an aromatic hydrocarbon that is a base for many petrochemicals and is used to derive orthoxylene and paraxylene. Orthoxylene is used in the production of plasticisers, vitamins, drugs, and dyes and paraxylene is used in the production of polyester and PTA.

9. INFORMATION ON OUR DIRECTORS, KEY MANAGEMENT, PROMOTER AND SUBSTANTIAL SHAREHOLDERS

9.1 BOARD OF DIRECTORS

Our Board acknowledges and takes cognisance of the MCCG, which contains practices to promote greater internalisation of corporate governance culture in companies. The MCCG is specifically targeted at listed companies on Bursa Securities. Listed companies from the year ending 31 December 2017 onwards are required to provide explanation on the application of each practice of the MCCG in their annual reports. Where there is a departure from a practice, the company must provide an explanation for the departure and disclose the alternative adopted and the manner in which the alternative achieves the intended outcome of that practice.

Our Board believes that our current Board composition provides the appropriate balance in terms of skills, knowledge and experience to promote the interests of all shareholders and to govern our Group effectively.

Our Board is also committed to achieving and sustaining high standards of corporate governance. In regards to the above, in relation to certain practices, such as having a majority of our Board comprising independent directors and at least 30% women directors, we endeavour to comply with these practices within two years from our Listing. We intend to take certain steps including but not limited to appointing new directors to achieve diversity in our boardroom to comply with these practices. Our Board will also provide an explanation on the extent of compliance with the MCCG in our first annual report as a listed entity for the year ending 31 December 2017.

Within the limits set by our Constitution, our Board is responsible for the governance and management of our Company. To ensure the effective discharge of its functions, our Board endeavours to follow the MCCG and have set out the following responsibilities in our board charter:

(a) together with our senior management, promote good corporate governance culture within our Company which reinforces ethical, prudent and professional behaviour;

(b) to review, challenge and decide on our management's proposals for our Company, and monitor its implementation by our management;

(c) to establish a strategic plan, including overall corporate strategy, marketing plan and human resources plan for our Company in line with our Company's vision, mission and business objectives;

(d) to ensure that the strategic plan of our Company supports long-term value creation and includes strategies on economic, environmental and social considerations underpinning sustainability;

(e) to oversee and review the conduct and performance of our Company and the President and Chief Executive Officer against set goals and objectives to evaluate whether the business is properly managed;

(f) to identify principal risks and ensure the implementation of appropriate systems to manage these risks;

(g) to understand the principal risks of our Company's business and recognise that business decisions involve the taking of appropriate risks;

(h) to set the risk appetite within which our Board expects our management to operate and ensure that there is an appropriate risk management framework to identify, analyse, evaluate, manage and monitor significant financial and non-financial risks;

(i) to ensure a sound succession plan and continuous development of human capital;

(j) to develop and implement an investor relations programme or shareholders' communications policy;

(k) to review and monitor the adequacy and integrity of internal control systems, risk management and management information systems including systems for the operation of the designated account into which the proceeds of our IPO earmarked for the Integrated Petrochemical Facility as set out in Section 4.7.1(i) of this Prospectus are deposited pending full use and compliance with applicable laws, regulations, rules, directives, and guidelines;

(l) to review our Company's strategic, capital or funding transactions and monitor execution of these transactions; and

(m) to ensure the integrity of our Company's financial and non-financial reporting.

In accordance with Article 94 of our Constitution, an election of Directors shall take place each year. At our first AGM, all Directors shall retire from office and at the AGM in every subsequent year, one-third of our Directors for the time being or, if their number is not three or a multiple of three, then the number nearest to one-third shall retire from office and be eligible for re-election PROVIDED ALWAYS that all Directors shall retire from office at least once in each three years but shall be eligible for re-election. A retiring Director shall retain office until the close of the meeting at which he retires.

In accordance with Article 95 of our Constitution, the Directors to retire in each year shall be those who have been longest in office since their last election but as between persons who became Directors on the same day, those to retire shall (unless they otherwise agree among themselves) be determined by lot.

In accordance with Article 101 of our Constitution, the Directors shall have power at any time and from time to time, to appoint any person to be a Director, either to fill a casual vacancy or as an addition to the existing Directors. Any Director so appointed shall hold office only until the next AGM, and shall then be eligible for re-election but shall not be taken into account in determining the Directors who are to retire by rotation at that meeting.

The number of Directors will not be less than two. As at the date of this Prospectus, our Board consists of six Directors, three of whom are Independent Directors.

The details of the members of our Board as at the date of this Prospectus and the details of the date of expiration of the current term of office for each of our Directors and the period that each of our Directors has served in that office are as follows:

Director	Age	Nationality	Date of appoint-ment	Designation	Date of expiration of the current term of office	No. of years and months in office as at the LPD
Tan Sri Dato' Abdul Rahman bin Mamat	64	Malaysian	2 June 2011	Independent Non-Executive Chairman	Subject to rotation at the AGM in year 2018	5 years and about 11 months
Lee Dong Woo	51	Korean	3 March 2017	Non-Independent Executive Director	Subject to rotation at the AGM in year 2019	About two months

Director	Age	Nationality	Date of appoint-ment	Designation	Date of expiration of the current term of office	No. of years and months in office as at the LPD
Lee Kwan Ho	52	Korean	10 June 2015	Non-Independent Executive Director	Subject to rotation at the AGM in year 2018	1 year and about 11 months
Cho Seongtaeg	54	Korean	31 March 2017	Non-Independent Non-Executive Director	Subject to rotation at the AGM in year 2020	About two months
Tan Sri Datuk (Dr.) Rafiah binti Salim	70	Malaysian	31 March 2017	Independent Non-Executive Director	Subject to rotation at the AGM in year 2019	About two months
Ang Ah Leck	60	Malaysian	31 March 2017	Independent Non-Executive Director	Subject to rotation at the AGM in year 2020	About two months

Save for Lee Dong Woo, Lee Kwan Ho and Cho Seongtaeg who are representatives of LCC on our Board, none of our Directors represent any corporate shareholder.

9.1.1 Profile of our Directors

(i) Tan Sri Dato' Abdul Rahman bin Mamat

Tan Sri Dato' Abdul Rahman bin Mamat, aged 64, is our Independent Non-Executive Chairman. He graduated with a Bachelor of Economics (Honours) from Universiti Malaya in 1975 and has obtained an Advanced Management Programme qualification from Harvard Business School, Boston, United States in 2004.

He joined MITI as an Assistant Director in April 1975 and served in various capacities in MITI for 35 years before retiring in December 2010 which included: (a) Deputy Trade Commissioner, Malaysian Trade Office, New York, the United States; (b) Director of Trade, Malaysian Trade Centre, Taipei, Taiwan; (c) Economic Counsellor/Trade Commissioner and Deputy Permanent Representative to the United Nations Economic and Social Commission, Malaysian Trade Office, Bangkok, Thailand; (d) Special Assistant to the then Minister of MITI, Tan Sri Rafidah Aziz; (e) board of director, Malaysian Industry-Government Group for High Technology (MIGHT); (f) Director of Industries; (g) Senior Director, Policy and Industry, Services Division; (h) Chairman of Malaysia External Trade Development Corporation ("**MATRADE**"); (i) Deputy Secretary-General (Industry); and (j) Secretary General of MITI.

During his tenure in MITI, he also served as MITI's representative on the board of various government-linked companies and corporations including MIDA, Johor Corporation, Regional Economic Development Authority (RECODA), Sarawak and Small and Medium Enterprise Corporation Malaysia, Pahang State Economic Development Corporation, Malaysian Technology Development Corporation and MATRADE.

He had represented Malaysia in numerous international meetings, negotiations, conferences and symposiums and had involved in formulating, implementing and monitoring policies and strategies on international trade and industries as well as entrepreneurship development.

He was an honorary member of the ASEAN Federation of Engineering Organisations, a Malaysian Leader for the High Level Task Force on ASEAN Economic Integration and is the Chairman of the Advisory Board of the International Council for SME & Entrepreneur Malaysia, and Board of Trustee of Enactus Malaysia Foundation, a non-profit organisation aimed at grooming university students into future leaders.

He sits on the boards of directors of several public listed companies in Malaysia, namely Hiap Teck Venture Berhad, BioAlpha Holdings Berhad, Dagang NeXchange Berhad and Parkson Holdings Berhad as well as a non-listed public company, Malaysian Industrial Development Finance Berhad, and several private limited companies in Malaysia which are involved in finance, manufacturing, retail and services sectors covering global logistics, healthcare and, oil, gas and energy.

For further details on the principal business activities performed outside our Group by Tan Sri Dato' Abdul Rahman bin Mamat as at the LPD and his directorships outside our Group, please refer to Section 9.1.3 of this Prospectus.

(ii) Lee Dong Woo

Lee Dong Woo, aged 51, is our Non-Independent Executive Director and our President and Chief Executive Officer. He obtained his Chemical Engineering degree from Seoul National University, Korea in 1989. He later obtained his Masters in Chemical Engineering from Korea Advanced Institute of Science and Technology, Korea in 1998 and his Doctorate in Polymer Engineering from Chungnam National University, Korea in 2013.

He started his career in 1989 as a researcher in the Manufacturing Research Office with Honam Petrochemical Corp. *(now known as LCC)*. Throughout his tenure with LCC, he was responsible for heading many research teams in new invention of polymer technology and also held key position in new business teams. He was part of the 1st Research Team for Research and Business Development of polypropylene, polyethylene, polyethylene terephthalate and compounds. He was also a member of the Business Development Team for the mergers and acquisition of Hyundai Petrochemical Corporation that had involved LG Chem Ltd and Honam Petrochemical Corp. in 2002 to 2005. He was promoted to General Manager for Research & Business Development and Technical Service for polypropylene and PE from 2005 to 2008. From 2008 to 2011, he was General Manager of the 3rd Research Team for Research & Business Development and Technical Service for Performance Materials. He was a member of the team that was involved in the acquisition of Sambark LFT in July 2009 which is now one of LCC's subsidiaries which produces and distributes various chemical products. In 2011, he was promoted to R&D Director for Research & Business Development and Technical Service for Polymer and Catalyst. He was Head of Lotte Chemical R&D Centre from 2012 until 2017 as well as Head of Water Treatment-Business Division from 2015 until 2017.

He joined our Company on 31 March 2017 as President and Chief Executive Officer.

He has over 28 years of experience in the petrochemical industry.

(iii) Lee Kwan Ho

Lee Kwan Ho, aged 52, is our Non-Independent Executive Director and our Vice President, Olefins and Derivatives Business. He obtained his Bachelor degree in Law from Yonsei University, Korea in 1989.

He started his career in 1989 as Officer with Hyundai Petrochemical Corp. (*now part of LCC Group*). In 2005, he joined Lotte Daesan Petrochemical Corp. as Officer where he was responsible for planning, feedstock, business development and legal until 2010. In 2010, he joined DACC Aerospace Ltd. as Head of Business Division where he was responsible for managing the finance, accounting, corporate affairs, human resources and information technology functions until 2012. In 2012, he joined LCC as Leader of Feedstock Team and subsequently, promoted to Head of Olefins Business Unit where he was responsible for purchasing feedstock and managing the supply and demand of olefins and other products until 2014. From 2014 until 2015, he was Head of Procurement and in 2015, he became Head of Corporate Planning until 2016. He joined our Company in 2016 as Vice President, Olefins and Derivatives Business where he is responsible for managing of feedstock purchases and monomers products sales.

He has over 28 years of experience in the petrochemical industry.

For further details on the principal business activities performed outside our Group by Lee Kwan Ho as at the LPD and his directorship outside our Group, please refer to Section 9.1.3 of this Prospectus.

(iv) Cho Seongtaeg

Cho Seongtaeg, aged 54, is our Non-Independent Non-Executive Director. He graduated with a Bachelor of Business Administration from Chosun University, Korea in 1989.

In 1990, he started his career as Officer in Honam Petrochemical Corp. *(now known as LCC)* where he was responsible for Accounting, Planning and Management related duties until 2002. He became the General Manager in the same company where he was responsible for Planning and Operation from 2002 until 2008. In 2009, he was the General Manager of Weifang Yaxing Honam Chemical Co., Ltd where he was responsible for business administration related duties which include finance, accounting, budgeting and human resources ("**Business Administration**"). In 2010, he was appointed as General Manager of Honam Chemical Trading (Shanghai) Corp (*now known as Lotte Chemical Trading (Shanghai) Corp.*) where he was responsible for Business Administration. He joined Honam Petrochemical (Jiaxing) Corp (*now known as Lotte Petrochemical (Jiaxing) Corp.*) in 2011 as a General Manager where he was also responsible for Business Administration until 2012. In 2013, he was promoted to the Director of Lotte Chemical Corporation (Jiaxing) where he was responsible for Business Administration. He was then appointed as Chief Financial Officer of LCC in April 2015, a position which he still holds today. He is responsible for overseeing finance related matters of LCC such as financial reporting and analysis, budgeting, corporate finance and treasury function.

(v) Tan Sri Datuk (Dr.) Rafiah binti Salim

Tan Sri Datuk (Dr.) Rafiah binti Salim, aged 70, is our Independent Non-Executive Director. She graduated with a Bachelor of Laws from Queen's University of Belfast in 1971. In 1974, she obtained her Master of Laws and subsequently received her Honorary Doctorate from Queen's University of Belfast in 2005. She obtained the Certificate in Legal Practice in 1980 and was admitted as an Advocate & Solicitor of the High Court of Malaya in the same year.

In 1974, Tan Sri Datuk (Dr.) Rafiah binti Salim started her career as an Associate Professor at the Faculty of Law, Universiti Malaya. She lectured in the Law of Contract, Company and Commercial Law, Evidence and Family Law. In 1988, she ended her service with Universiti Malaya as the Dean of the faculty. In the same year, she moved to become the Head of Legal Department for Malayan Banking Berhad ("**Maybank**"). She was then promoted to the post of General Manager of the Human Resource Department at Maybank in 1991. In 1995, she left Maybank to serve BNM as Assistant Governor for the Security Department, Legal Department and Property and Service Department until 1997.

Her international experience was as Assistant Secretary General for Human Resource Management, United Nations, New York from 1997 to 2002. She was the first Malaysian to be appointed to a high post in the United Nations System. In 2003, she became the Executive Director of the International Centre for Leadership in Finance until 2005. She was then appointed as Vice-Chancellor/President of Universiti Malaya in 2005 where she served until 2006.

She sits on the board of directors of several public listed companies in Malaysia, namely Nestle (Malaysia) Berhad, Allianz Malaysia Berhad and Malaysian Genomics Resources Centre Berhad as well as several non-listed public companies, namely Allianz Life Insurance Malaysia Berhad and Allianz General Insurance Company (Malaysia) Berhad.

For further details on the principal business activities outside our Group performed by Tan Sri Datuk (Dr.) Rafiah binti Salim as at the LPD and her directorships outside our Group, please refer to Section 9.1.3 of this Prospectus.

(vi) Ang Ah Leck

Ang Ah Leck, aged 60, is our Independent Non-Executive Director. He qualified as a Certified Public Accountant in 1984. He has memberships with the Malaysian Institute of Accountants since 1987, Malaysian Institute of Certified Public Accountants since 1984 and Chartered Tax Institute of Malaysia since 1999.

He started his career with KPMG Malaysia in 1978 as an articled clerk where he was responsible for providing audit services. After passing his professional examinations in 1984, he became Audit Senior in the same year. He was seconded to the KPMG office in Houston, Texas in 1987 as an audit supervisor where he was responsible for the audits of some major oil and gas companies until 1989.

He returned to Malaysia in 1989 and became a Manager in KPMG and subsequently, a Director in 1993. In 1997, he was admitted as a partner of KPMG where he was responsible for audits of private and public listed companies. He later served as the partner-in-charge of the Johor Bahru office until his retirement from KPMG in 2011. He came out of retirement in August 2014 by joining BDO as Executive Director, Advisory, a position he still holds today. As Executive Director, Advisory, he is responsible as an engagement director for the internal audit, enterprise risk management, corporate governance and forensic services.

9.1.2 Shareholding of our Directors

The following table sets out the direct and indirect shareholding of our Directors before and after our IPO based on our Register of Directors' Shareholdings as at the LPD (assuming full subscription of our IPO Shares allocated to the Eligible Persons):

	Before our IPO				After our IPO[1]			
	Direct		Indirect		Direct		Indirect	
Name	No. of Shares	%	No. of Shares	%	No. of Shares	%	No. of Shares	%
Tan Sri Dato' Abdul Rahman bin Mamat	-	-	-	-	[2]30,000	*	-	-
Lee Dong Woo	-	-	-	-	[3]22,500	*	-	-
Lee Kwan Ho	-	-	-	-	[3]22,500	*	-	-
Cho Seongtaeg	-	-	-	-	[3]22,500	*	-	-
Tan Sri Datuk (Dr.) Rafiah binti Salim	-	-	-	-	[2]22,500	*	-	-
Ang Ah Leck	-	-	-	-	[2]22,500	*	-	-

Notes:

* Less than 0.1%.
(1) Based on our enlarged issued share capital of 2,468,274,500 Shares after our IPO.
(2) Excludes Shares he/she may subscribe under the Malaysian Public's portion under the Retail Offering and any Excess IPO Shares that he/she may subscribe under the allocation to the Eligible Persons.
(3) Not eligible to subscribe under the Malaysian Public's portion under the Retail Offering but he may subscribe for Excess IPO Shares under the allocation to the Eligible Persons.

9.1.3 Involvement of our Directors in principal business activities outside our Group and principal directorship of our Directors

The principal business activities outside our Group performed by our Directors as at the LPD and the directorships of our Directors outside of our Group at present and in the past five years preceding the LPD are as follows:

Director	Directorships	Principal activities	Involvement in business activities other than as a director
Tan Sri Dato' Abdul Rahman bin Mamat	*Present directorships:*		
	• Annexe Fair Sdn Bhd	• Investment holding in oil and gas industry	• Shareholder with 36.5% equity interest
	• Aryoasian Sdn Bhd	• Research and development on medical sciences	• Shareholder with 50.0% equity interest
	• Asia Logistics Council Sdn Bhd	• Provision of global coalition efficient logistics systems for the Asia Pacific region	• Nil

Director	Directorships	Principal activities	Involvement in business activities other than as a director
	• BGE Enviro Supply Sdn Bhd	• Dormant	• Nil
	• BGE Industry Support Sdn Bhd	• Dormant	• Nil
	• Bio Innovation Sdn Bhd	• To promote the development of contract research services and contract manufacturing services	• Nil
	• Bioalpha Holdings Berhad	• Investment holdings (investment in subsidiaries which principal activities are manufacturing and sale of semi-finished and finished health supplement products)	• Nil
	• Broadgate Engineering (M) Sdn Bhd	• Engineering and construction works	• Shareholder with 39.0% equity interest
	• Dagang Nexchange Berhad	• Investment holding (investment in subsidiaries which principal activities are in the oil and gas services and in the upstream oil and gas, energy industry and information technology industry)	• Nil
	• Eastern Steel Sdn Bhd	• Manufacturing, selling and dealing in scaffolding, a range of steel products and steel fabricators	• Nil
	• Evercare Plus Sdn Bhd	• Research and development on medical sciences	• Shareholder with 50.0% equity interest
	• Hiap Teck Venture Berhad	• Investment and property holdings and the provision of management services (investment in subsidiaries which principal activities are the manufacture and trading of steel products and logistics)	• Nil
	• Inno Bio Diagnostics Sdn Bhd	• To develop business opportunities in the area of cell-based diagnostics and regenerative medicine	• Nil
	• Inno Bio Ventures Sdn Bhd	• Investment holding, manufacturing, consulting and providers of education and training related to biotechnology	• Nil
	• Inno Biologics Sdn Bhd	• Manufacturing, bioprocess development, consulting and provision of education and training related to biotechnology	• Nil
	• Innozentux Sdn Bhd	• Research and development on medical sciences	• Shareholder with 50.0% equity interest

9. INFORMATION ON OUR DIRECTORS, KEY MANAGEMENT, PROMOTER AND SUBSTANTIAL SHAREHOLDERS *(Cont'd)*

Director	Directorships	Principal activities	Involvement in business activities other than as a director
	• International Council for SMEs & Entrepreneur Malaysia	• Not applicable	• Nil
	• Malaysian Industrial Development Finance Berhad	• Investment holding, providing finance, leasing and industrial hire-purchase services to industries (investment in subsidiaries which principal activities are investment banking, development finance, asset management and mezzanine financing)	• Nil
	• Malaysian Technology Development Corporation Sdn Bhd	• Venture capital activities, management of government grants	• Nil
	• Nexus Pacific Property Sdn Bhd	• Dormant	• Nil
	• Oceanmight Sdn Bhd	• General trading, construction and maintenance services, steel structural fabrication, provision of structural assemblies and engineering services	• Shareholder with 37.0% equity interest
	• Parkson Holdings Berhad	• Investment holding (investment in subsidiaries which principal activities are the operations of the Parkson brand department stores and management services)	• Nil
	• River Of Life Hospital & Healthcare Sdn Bhd	• Business to develop, own, manage and maintain hospital operations and other related service	• Shareholder*
	• Yayasan Enactus Malaysia	• Education and entrepreneurship	• Member of the board of trustee
	• Yayasan Tan Sri SM Nasimuddin	• To receive, raise, manage and administer funds	• Member of the board of trustee
	• Nil	• Nil	• Shareholder of Nagasari Tuah Sdn Bhd *(Winding-up)* with 30.0% equity interest
	Previous directorships:		
	• MMC Petroleum & Resources Sdn Bhd *(resigned on 2 April 2014)*	• Investment holding and provision of professional services to the oil and gas and resources industries	• Nil
	• Naza TTDI Sdn Bhd *(resigned on 10 June 2016)*	• Property development	• Nil

9. INFORMATION ON OUR DIRECTORS, KEY MANAGEMENT, PROMOTER AND SUBSTANTIAL SHAREHOLDERS *(Cont'd)*

Director	Directorships	Principal activities	Involvement in business activities other than as a director
Lee Kwan Ho	*Present directorship:*		
	• Lotte Ube (alternate director)	• Manufacture and trading of synthetic rubber	• Nil
Cho Seongtaeg	*Present directorships:*		
	• Asian Acetyls Co., Ltd	• Manufacturing and distribution of petroleum and petrochemical products	• Nil
	• DACC Aerospace Corp	• Manufacturing and distribution of carbon fiber	• Nil
	• Hyundai Chemical Corp	• Manufacturing and distribution of petroleum and petrochemical products	• Nil
	• Lotte Fine Chemical Co., Ltd	• Manufacturing and distribution of various chemical products	• Nil
	• Lotte Mitsui Chemicals Inc	• Manufacturing and distribution of various chemical products	• Nil
Tan Sri Datuk (Dr.) Rafiah binti Salim	*Present directorships:*		
	• Allianz General Insurance Company (Malaysia) Berhad	• Underwriting of all classes of general insurance business	• Nil
	• Allianz Life Insurance Malaysia Berhad	• Underwriting of life insurance and investment linked business	• Nil
	• Allianz Malaysia Berhad	• Investment holding (investment in subsidiaries which principal activities are investment holding, underwriting life insurance and investment-linked business, and underwriting general insurance business)	• Nil
	• Malaysian Genomics Resource Centre Berhad	• Providing genome sequencing, bioinformatics analysis services and genetic screening services, online access to genomic data and bioinformatics applications and investment holding	• Nil
	• Nestle (Malaysia) Berhad	• Investment holding company (investment in subsidiaries which principal activities are marketing and sales of ice-cream, powdered milk and drinks, liquid milk and juices, instant coffee and other beverages, chocolate confectionery products, instant noodles, culinary products, cereals, yogurt and related products, manufacturing and sales of chocolate confectionery products)	• Nil

Director	Directorships	Principal activities	Involvement in business activities other than as a director
	• YR Associates Sdn Bhd	• Professional advisory and consultancy	• Nil
	Previous directorships:		
	• Cerebos (Malaysia) Sdn Bhd *(resigned on 25 April 2016)*	• Manufacturing, marketing and distribution of chicken essence and related food products	• Nil
	• Perbadanan Usahawan Nasional Berhad *(resigned on 6 October 2016)*	• Providing venture capital, financing and management expertise to small sized and medium sized bumiputra business	• Nil

Note:

* Less than 0.1%.

9.1.4 Involvement of our Executive Directors in other businesses or corporations

Save as disclosed in Section 9.1.3 of this Prospectus, as at the LPD, our Executive Directors, Lee Dong Woo and Lee Kwan Ho are not involved in other businesses and/or corporations outside of our Group.

Our Directors are of the view that Lee Kwan Ho's involvement in Lotte Ube will not affect his commitments, contributions and responsibilities to our Group and is not expected to affect our Group's operations. This is in view that Lee Kwan Ho's directorship in Lotte Ube is required mainly for attendance at the respective board of directors' meetings as an alternate director, which does not require a significant amount of his time. Further, Lotte Ube's daily operations are managed by its key management personnel. Lee Kwan Ho has and will continue to ensure that he will be able to fulfil and discharge his duties and responsibilities in our Group effectively.

9.1.5 Interest of our Directors in other businesses or corporations which carry on a similar trade as that of our Group or which are our customers and/or suppliers

Save as disclosed below, as at the LPD, none of our Directors have any interest, direct or indirect, in other businesses or corporations which are (i) carrying on a similar trade as that of our Group; or (ii) our customers and/or suppliers:

Director	Business/Corporation	Principal activity	Nature of interest
Cho Seongtaeg	*Similar trade as that of our Group:*		
	• Asian Acetyls Co., Ltd[1]	• Manufacturing and distribution of petroleum and petrochemical products	• Director
	• Hyundai Chemical Corp[2]	• Manufacturing and distribution of petroleum and petrochemical products	• Director
	• Lotte Fine Chemical Co., Ltd ("**Lotte Fine Chemical**")[2]	• Manufacturing and distribution of various chemical products	• Director

Director	Business/Corporation	Principal activity	Nature of interest
	• Lotte Mitsui Chemicals Inc[2]	• Manufacturing and distribution of various chemical products	• Director

Notes:

(1) 33% held by Lotte Fine Chemical

(2) Subsidiaries of LCC

Our Directors are of the view that Cho Seongtaeg's involvement in other businesses or corporations which carry on similar trade as that of our Group, do not give rise to any conflict of interest situation with the business currently held and pursued by our Group as:

(i) the petrochemical products manufactured and distributed by Asian Acetyls Co., Ltd, Lotte Fine Chemical Co., Ltd and Lotte Mitsui Chemicals Inc are different from that manufactured and distributed by our Group;

(ii) whilst Hyundai Chemical Corp manufactures a product which is also manufactured and distributed by our Group, namely benzene, the benzene manufactured by Hyundai Chemical Corp is not sold to third parties but is consumed internally by the LCC Group; and

(iii) whilst he is the Chief Financial Controller of LCC, he is a Non-Executive Director of our Company and is not involved in the day-to-day operations of our Group. Please also refer to Section 9.3.4 of this Prospectus for details on LCC's involvement in other businesses or corporations which carry on a similar trade as that of our Group.

On matters or transactions requiring the approval of our Board, a Director who is deemed interested or conflicted in such matters will be required to abstain from deliberations and voting on the resolutions relating to these matters or transactions.

9.1.6 Audit and Risk Management Committee

Our Audit and Risk Management Committee was established by our Board on 31 March 2017. Our Audit and Risk Management Committee currently comprises the following members, of which all are Independent Non-Executive Directors:

Director	Designation	Directorship
Ang Ah Leck	Chairman	Independent Non-Executive Director
Tan Sri Dato' Abdul Rahman bin Mamat	Member	Independent Non-Executive Director
Tan Sri Datuk (Dr.) Rafiah binti Salim	Member	Independent Non-Executive Director

The duties and functions of our Audit and Risk Management Committee comprise, among others, the following:

(i) to consider the appointment and/or re-appointment of the internal auditors and external auditors, the audit fee and any questions of resignation or dismissal including recommending the nomination of person(s) as auditors;

(ii) to establish policies governing the circumstances under which contracts for the provision of non-audit services can be entered into and procedures that must be followed by the external auditors;

(iii) to discuss with the external auditors before the audit commences, the nature and scope of the audit, and ensure co-ordination where more than one audit firm is involved;

(iv) to review with the external auditors on:

(a) the audit plan, its scope and nature;

(b) the audit report;

(c) the results of their valuation of the accounting policies, controls and systems within our Group; and

(d) the assistance given by the officers of our Company to external auditors, including any difficulties or disputes with management encountered during the audit;

(v) to review the quarterly reports on consolidated results and year-end financial statements of our Company before submission to our Board, focusing particularly on:

(a) changes in or implementation of major accounting policy changes;

(b) significant matters highlighted including financial reporting issues, significant judgments made by management, significant and unusual events or transactions, and how these matters are addressed;

(c) compliance with applicable accounting standards and other legal or regulatory requirements;

(d) significant adjustments arising from the audit;

(e) the going concern assumption; and

(f) major judgement areas;

(vi) to discuss problems and reservations arising from the interim and final audits, and any matter the auditors may wish to discuss (in the absence of management, where necessary);

(vii) to ensure fair and transparent reporting and prompt publication of the financial accounts;

(viii) to review with management:

(a) audit reports and management letter issued by the external auditors and the implementation of audit recommendations;

(b) interim financial information; and

(c) the assistance given by the officers of our Company to external auditors;

(ix) to do the following in relation to the internal audit function:

(a) review the adequacy of the scope, functions, competency and resources of the internal audit and compliance functions, and that each function has the necessary authority to carry out its work;

(b) review, challenge and approve the internal audit charter, internal audit annual budget, audit and compliance plans, risk assessment and audit methodology and ensure adequacy of their scopes, robustness in the planning process and sufficient resources to implement the plans independently and objectively, and that they have the necessary authority to carry out their work;

(c) review compliance reports, discuss major findings and deficiencies in internal controls and management response and ensure agreed actions are taken timely;

(d) approve the appointment or termination of the heads of assurance and compliance and assess their performance;

(e) review any difficulties encountered in the course of audit or compliance work, including any restrictions on the scope of activities or access to required information;

(f) review the internal audit programme and results of the internal audit process and, where necessary, ensure that appropriate actions are taken on the recommendations of the internal audit function;

(g) review the internal audit plan, consider the internal audit reports and findings of the internal auditors, fraud investigations and actions and steps taken by management in response to audit findings;

(h) review any appraisal or assessment of the performance of members of the internal audit function;

(i) approve any appointment or termination of senior staff members of the internal audit function; and

(j) take cognisance of resignations of internal audit staff members and provide the resigning staff member an opportunity to submit his reason for resigning;

(x) to consider any related party transaction entered into by our Company or our Group and to determine if such transactions are undertaken on an arm's length basis and normal commercial terms and on terms not more favourable to the related parties than those generally available to the public, and to ensure that our Directors report such transaction annually to shareholders via the annual report, and to review conflicts of interest that may arise within our Company or our Group including any transaction, procedure or course of conduct that raises questions of management integrity;

(xi) to report its findings on the financial and management performance, and other material matters to our Board;

(xii) to consider the major findings of internal investigations and management's response;

(xiii) to monitor the integrity of our Company's financial statements;

(xiv) to review the independence and qualification of our Company's external auditors;

(xv) to monitor the performance of our Company's internal audit function;

(xvi) to review the adequacy and effectiveness of risk management, internal control and governance systems;

(xvii) to provide in-depth governance of risks for our Group;

(xviii) to assist our Board to fulfil its corporate governance, risk management and statutory responsibilities in order to effectively manage the overall risk exposure of our Group;

(xix) to assist our Board in applying principles and good practices of corporate governance, sustainability and corporate responsibility towards our Group's stakeholders and to ensure compliance with applicable regulatory and legal requirements;

(xx) to oversee the internal controls framework to ensure operational effectiveness and adequate protection of our Group's assets;

(xxi) to ensure that proper processes and procedures are in place to comply with all laws, regulations and rules established by all relevant regulatory bodies;

(xxii) to consider and examine such other matters as the Audit and Risk Management Committee considers appropriate; and

(xxiii) to consider other matters as defined by our Board.

9.1.7 Nomination Committee

Our Nomination Committee was established by our Board on 31 March 2017. Our Nomination Committee currently comprises the following members, of which a majority of them are Independent Non-Executive Directors:

Director	Designation	Directorship
Tan Sri Datuk (Dr.) Rafiah binti Salim	Chairman	Independent Non-Executive Director
Ang Ah Leck	Member	Independent Non-Executive Director
Cho Seongtaeg	Member	Non-Independent Non-Executive Director

Our Nomination Committee undertakes, among others, the following functions:

(i) to assess and recommend to our Board, candidates for all directorships. In making its recommendations, the Nomination Committee will consider the candidates':

(a) technical competency, diversity in skills, knowledge, expertise, experience, age, cultural background and gender;

(b) strong sense of professionalism;

(c) integrity;

(d) other commitments and time available to contribute inputs to our Board; and

(e) in the case of candidates for the position of Independent Non-Executive Directors, the Nomination Committee will evaluate the candidates' ability to discharge such responsibilities/functions as expected from Independent Non-Executive Directors;

(ii) to provide an appropriate balance of knowledge, experience and capability from a diverse background, including gender, age and ethnicity to complement our Board. Women candidates will be sought in its recruitment exercise for Board positions to meet targets under the MCCG;

(iii) to consider, in making its recommendations, candidates for directorships proposed by any Director or shareholder. Our Board may also utilise independent sources to identify suitable candidates;

(iv) to recommend to our Board the nominees to fill the seats on Board committees;

(v) to assess and recommend to our Board new appointees for key senior management positions;

(vi) to review Board and key senior management succession plans;

(vii) to review the training needs/training programmes for our Board and facilitate Board induction and training programmes;

(viii) to review annually, the term of office and performance of the Audit and Risk Management Committee and each of its members to determine whether the Audit and Risk Management Committee and members have carried out their duties in accordance with the terms of reference of the Audit and Risk Management Committee;

(ix) to implement annual assessment by engaging independent experts (in this context, independent means no connection with our Company, Directors or major shareholders) on the effectiveness and performance of the our Board as a whole, the committees of our Board, as well as the contribution/performance of each individual Director, including Non-Executive Directors and Executive Director(s). All assessments and evaluations carried out by the Nomination Committee in the discharge of all its functions will be properly documented;

(x) to examine the size of our Board with a view to determining the impact of the number upon our Board's effectiveness;

(xi) to review the required mix of skills and experience and other qualities including core competencies which Non-Executive Directors should bring to our Board;

(xii) to develop the criteria to assess independence and to assess on an annual basis, the independence of the Independent Non-Executive Directors and recommend the same to our Board;

(xiii) to recommend the retention of Independent Non-Executive Directors whose terms have exceeded nine years' tenure for continuance in the office;

(xiv) to recommend the re-election of Directors who retire by rotation pursuant to our Company's Constitution;

(xv) to review the attendance of our Directors at Board and/or Board committee(s) meetings;

(xvi) to establish a policy formalising its approach to boardroom diversity;

(xvii) to develop and monitor compliance of membership qualifications for our Board and all board committees, including defining specific criteria for the independence of Directors and committees; and

(xviii) to consider and examine such other matters as the Nomination Committee considers appropriate.

9.1.8 Remuneration Committee

Our Remuneration Committee was established by our Board on 31 March 2017. Our Remuneration Committee currently comprises the following members:

Director	Designation	Directorship
Tan Sri Dato' Abdul Rahman bin Mamat	Chairman	Independent Non-Executive Director
Tan Sri Datuk (Dr.) Rafiah binti Salim	Member	Independent Non-Executive Director
Cho Seongtaeg	Member	Non-Independent Non-Executive Director

Our Remuneration Committee undertakes, among others, the following functions:

(i) to develop and formulate a transparent policy on the remuneration of Directors and key senior management, and to set the remuneration package of our Directors and key senior management;

(ii) to adopt a formal and transparent procedure for determining the remuneration package of Directors and key senior management, which takes into account the demands, complexities and performance of our Company and objective considerations of the merits and values of their contributions to our Company, conducted annually;

(iii) to ensure that the remuneration, benefits and rewards of Directors and key senior management are linked to corporate and individual performance;

(iv) to ensure that the remuneration package is sufficient to attract and retain the Directors and key senior management needed to manage our Company successfully;

(v) to ensure the remuneration policies and procedures are periodically reviewed;

(vi) to recommend the engagement of expert professional advisors to assist and/or advise the Remuneration Committee, on remuneration matters where necessary; and

(vii) to perform such other functions assigned by our Board.

9.1.9 Service contracts with our Directors

As at the date of this Prospectus, there is no existing or proposed service contract between our Directors and us.

9.1.10 Remuneration and material benefits-in-kind of our Directors

The remuneration and material benefits in-kind paid or proposed to be paid to our Directors for services rendered to us in all capacities for the year ended 31 December 2016 and year ending 31 December 2017 respectively, are as follows:

9. INFORMATION ON OUR DIRECTORS, KEY MANAGEMENT, PROMOTER AND SUBSTANTIAL SHAREHOLDERS *(Cont'd)*

Director	Remuneration band	
	For the year ended 31 December 2016 (Actual)	For the year ending 31 December 2017 (Estimate)
Tan Sri Dato' Abdul Rahman bin Mamat	RM50,001 – RM100,000	RM250,001 – RM300,000
Lee Dong Woo	-	RM950,001 – RM1,000,000[1]
Lee Kwan Ho	RM300,001 – RM350,000	RM1,150,001 – RM1,200,000
Cho Seongtaeg	-	-
Tan Sri Datuk (Dr.) Rafiah binti Salim	-	RM150,001 – RM200,000[2]
Ang Ah Leck	-	RM150,001 - RM200,000[2]

Notes:

(1) Represents remuneration to be paid which has been pro-rated based on his date of appointment on 3 March 2017.

(2) Represents remuneration to be paid which has been pro-rated based on his/her date of appointment on 31 March 2017.

The remuneration of our Directors, which includes Directors' fees, bonus and such other allowances as well as other benefits, must be considered and recommended by our Remuneration Committee and subsequently approved by our Board. Our Directors' fees and benefits must be further approved/endorsed by our shareholders at a general meeting.

9.2 KEY MANAGEMENT

Our key management is responsible for our day-to-day management and operations. Our key management consists of experienced personnel in charge of matters related to our Company's business and operations.

The members of our key management as at the date of this Prospectus are set out below:

Name	Nationality	Age	Designation
Lee Dong Woo	Korean	51	President and Chief Executive Officer
Park Beon Jin	Korean	53	Executive Vice President, Manufacturing
David Tan Gek Seng	Malaysian	55	Chief Financial Officer
Philip Kong Chock Hoon	Malaysian	57	Senior Vice President, Corporate Planning
Cheong Peng Khuan	Malaysian	59	Senior Vice President, Human Resource and Procurement
Lee Kwan Ho	Korean	52	Vice President, Olefins and Derivatives Business
Kim Daejoong	Korean	51	Vice President, Production Support
Salehaldin bin Nasron	Malaysian	54	Vice President, Corporate Affairs and Chief Information Officer

Name	Nationality	Age	Designation
Lau Chee Ming	Malaysian	52	Acting Vice President, Polymer Business[1]
Chair Lam Seng	Malaysian	49	Acting Vice President, Production[1]

Note:

(1) Identified for promotion to Vice President but currently under an observation period of 6 to 12 months. However, in terms of job scope and responsibilities, he is already functioning as a Vice President.

The management and operations of our Group is led by Lee Dong Woo, our President and Chief Executive Officer.

9.2.1 Profile of our key management

(i) Lee Dong Woo

Lee Dong Woo is our President and Chief Executive Officer and also our Non-Independent Executive Director. For details of Lee Dong Woo's profile, please refer to Section 9.1.1(ii) of this Prospectus.

(ii) Park Beon Jin

Park Beon Jin, aged 53, is our Executive Vice President, Manufacturing. He obtained his Bachelor degree in Chemical Engineering from Hanyang University, Korea in 1987.

He started his career as Engineer with Donyang Polyester in 1987 where he was responsible for polyethylene terephthalate production until 1990. He joined Hyundai Petrochemical Corp in 1990 as Engineer where he was responsible for polyethylene production and he was promoted to Senior Manager in 2001. In 2005, he joined LCC as Senior Manager where he was responsible for polyethylene, polypropylene and ethylene vinyl production until he was promoted to General Manager in 2012.

He was seconded to PT LCT Nusantara in 2012 as Deputy Manufacturing Director and was promoted to Manufacturing Director in the same year to take charge of the manufacturing operations in Merak, Cilegon, Banten Province, Indonesia. In 2014, he was promoted to President Director of PT LCT Nusantara before he was transferred to our Company in August 2014 as Vice President of Production and Technology and Development where he was responsible for the manufacturing department, which includes overseeing technical, safety and quality functions. He was promoted to Senior Vice President of the manufacturing department in 2015 and subsequently to his current position in 2016.

He has over 30 years of experience in polyolefins operations.

(iii) David Tan Gek Seng

David Tan Gek Seng, aged 55, is our Chief Financial Officer. He is a member of the Chartered Institute of Management Accountants, United Kingdom since 1988. He became a member of the Malaysian Institute of Accountants in 1989 and a member of the Chartered Tax Institute of Malaysia in 1995. He later obtained his Masters of Business Administration degree from University of Strathclyde, United Kingdom in 2000 and became a Certified Internal Auditor by the Institute of Internal Auditors, Inc (United States) in 2005.

He started his career in 1981 as Audit Assistant with Peat Marwick, Mitchell & Co *(now known as KPMG)* until 1983. He joined KK San, Liew & Loke as Audit Senior in 1984 until 1987. He joined MBf Finance Bhd in 1987 as Internal Audit Officer until 1989. Later in 1989, he joined Country View Realty Sdn Bhd as Accountant until 1991. In 1991, he joined our Company as Accounting Manager until 1995. He left our Company in 1995 to join Tru-Tech Holdings Bhd as Group Financial Controller and Company Secretary. In 1999, he joined Professional Conglomerate Sdn Bhd as Financial Controller until 2000. He re-joined our Company in 2000 as Business Planning and Analysis Manager until 2005. He was then promoted to Chief Internal Auditor in 2005 before assuming the position of Vice President, Financial Controller and Chief Information Officer in 2008. He assumed his current position on 2 June 2017.

He has over 36 years of experience in audit and finance functions.

(iv) Philip Kong Chock Hoon

Philip Kong Chock Hoon, aged 57, is our Senior Vice President, Corporate Planning. He obtained his Bachelor of Law (Hons) degree from Middlesex University, London in 1983 and then qualified as a Barrister-at-Law from Lincoln's Inn in 1984. In 1985, he was admitted to the High Court of Malaya as an advocate and solicitor.

He started his professional career in 1985 as a litigation lawyer with Shearn Delamore & Co. where his main area of practice was litigation. In 1987, he left the practice to work as Legal Adviser with the Shell group of companies in Malaysia. In 1997, he joined our Company as General Counsel where he was responsible for setting up the legal department and overseeing legal matters relating our Group. He left our Company in 2001 to join Thames Water, Asia Pacific in Singapore as Legal Manager until 2004. In 2005, he re-joined our Company as General Counsel and was promoted to Senior Vice President, General Counsel in 2008 before assuming his current position on 1 March 2017. He is responsible for corporate planning matters relating to the Group.

He has over 32 years of experience in the legal and corporate planning matters.

(v) Cheong Peng Khuan

Cheong Peng Khuan, aged 59, is our Senior Vice President, Human Resource and Procurement. He obtained his Bachelor degree in Science majoring in Business Management from University Sains Malaysia in 1985.

He started his career as a clerk with Ban Hin Lee Bank Bhd in 1978 where he was responsible for clerical and administrative duties until 1981. He pursued his undergraduate studies from 1981 to 1985. He then joined Hovid Pharmacy Sdn Bhd in 1985 as Medical Sales Representative where he was responsible in selling medicine to health professionals. He joined Texchem Trading Sdn Bhd as Sales Manager in 1987 where he was responsible for trading activities until 1991.

He joined our Company as Sales Manager in 1991 where he was responsible for sales in the Northern Market Region. He became Senior Vice President of Polymers Business in 2002 where he was responsible for the marketing of all polyolefin products in the domestic and international markets and was in charge of the PTC and Logistics until 2017. He had also assumed additional duties of heading the human resource department from 2010 to 2017. He assumed his current position on 1 March 2017.

He has over 26 years of experience in sales and marketing in the polyolefins and chemicals industry. He also has experience in managing human resource strategies in the area of staffing, employment law, performance management, employee relation and compensation and benefit.

(vi) Lee Kwan Ho

Lee Kwan Ho, aged 52, is our Vice President, Olefins and Derivatives Business and our Non-Independent Executive Director. For details of Lee Kwan Ho's profile, please refer to Section 9.1.1(iii) of this Prospectus.

(vii) Kim Daejoong

Kim Daejoong, aged 51, is our Vice President, Production Support. He obtained his Bachelor degree in Electrical Engineering from Kyung Pook University, Korea in 1990.

He began his career as Engineer with Honam Petrochemical Corp. *(now known as LCC)* in 1990 where he was responsible for electrical and instrument maintenance. In 2005, he became a Manager where he was responsible for managing the whole plant operation and facility inspection and engineering until 2010.

He joined our Company in 2011 as Director, Complex Maintenance and Engineering where he was responsible for managing complex-wide maintenance and engineering before assuming his current position in 2015.

He has over 27 years of experience in maintenance and engineering within the petrochemical industry.

(viii) Salehaldin bin Nasron

Salehaldin bin Nasron, aged 54, is our Vice President, Corporate Affairs and Chief Information Officer. He obtained his Diploma in Banking from University of Technology MARA in 1983 and Bachelor degree in Business Administration majoring in Finance and Accounting from Ohio University, United States in 1985. He later obtained his Master of Business Administration in Finance from University of Manchester, United Kingdom in 2012.

He started his career in 1985 as Management Trainee in General Accounting Department with Goodyear Malaysia Berhad and held various positions in the accounting department until he was promoted to Manager, Treasury Operations in 1992. In 1997, he was made Manager, Corporate Accounting and in year 2000, as Controller. He was promoted to General Manager, Finance and Information Technology in 2002. From 2003 to 2006, he was Financial Advisor and Controller for PT Goodyear Indonesia Tbk, a subsidiary of Goodyear Tire and Rubber Company USA. From 2006 to 2008, he was the Chief Financial Officer for Asia Pacific based in Kuala Lumpur for Cognis Oleochemicals (M) Sdn Bhd *(now known as Emery Oleochemicals (M) Sdn Bhd)*, a joint venture company between Cognis GmbH Germany and Malaysia's Golden Hope Plantations Berhad (*now known as Sime Darby Berhad)*. In 2008, he joined our Group as Finance Director of PT Titan Petrokimia Nusantara and was subsequently promoted to Vice President, Treasury and Credit Control for our Group in 2009. In 2012, he was redesignated as Treasurer and Vice President, Corporate Affairs and assumed his current position on 2 June 2017.

He has over 30 years of experience in finance and treasury functions.

(ix) Lau Chee Ming

Lau Chee Ming, aged 52, is our Acting Vice President, Polymer Business. He obtained his Bachelor degree in Science from Universiti Kebangsaan Malaysia in 1990.

He started his career in 1990 as Sales Executive with Texchem Trading Sdn Bhd. In 1991, he joined LCTM as Sales Executive and was promoted to Sales Manager in 1994. In 2002, he was promoted to polyethylene Product Manager. In 2003, he was transferred to the Chairman's Office for a span of six months as Manager. In 2004, he was transferred to the domestic sales department as Country Manager, responsible for domestic polymers sales.

In 2006, he was redesignated as Regional Manager where he was responsible for the export sales department. From 2006 until 2010, he was seconded to PT LCT Nusantara as Commercial Director. In 2010, he was transferred back to Malaysia and promoted to Director, Polymers Sales and Marketing. On 1 March 2017, following the restructuring exercise of our Company, he was redesignated as Acting Vice President of Polymers Business.

He has over 26 years of experience in sales and marketing in the polyolefins and petrochemicals industry.

(x) Chair Lam Seng

Chair Lam Seng, aged 49, is our Acting Vice President, Production. He obtained his Bachelor degree in Science Chemical Engineering from National Taiwan University, Taiwan in 1991.

He started his career in 1992 as Senior Process Engineer with Petrochemicals (M) Sdn Bhd until 1997. He joined Titan Polyethylene (Malaysia) Sdn Bhd (now known as LCT Trading) as Process Engineer in 1997 where he was responsible for overseeing the Distributed Control System and process optimisation for the PE2 Plant. He was subsequently promoted to Senior Manager when he joined our Company in 2010 to oversee production of the PE2 Plant and PE3 Plant. On 1 March 2017, he was redesignated to his current position.

He has over 24 years of experience in engineering within the petrochemical industry.

9.2.2 Shareholding of our key management

The following table sets out the direct and indirect shareholding of each of our key management before and after our IPO (assuming full subscription of our IPO Shares allocated to the Eligible Persons under our IPO):

	Before our IPO				After our IPO[1]			
	Direct		Indirect		Direct		Indirect	
Name	No. of Shares	%	No. of Shares	%	No. of Shares	%	No. of Shares	%
Lee Dong Woo	-	-	-	-	[2]22,500	-	-	-
Park Beon Jin	-	-	-	-	[2]13,000	*	-	-
David Tan Gek Seng	-	-	-	-	[3]13,000	*	-	-
Philip Kong Chock Hoon	-	-	-	-	[3]13,000	*	-	-

	Before our IPO				After our IPO[1]			
	Direct		Indirect		Direct		Indirect	
Name	No. of Shares	%	No. of Shares	%	No. of Shares	%	No. of Shares	%
Cheong Peng Khuan	-	-	-	-	[3]13,000	*	-	-
Lee Kwan Ho	-	-	-	-	[2]22,500	-	-	-
Kim Daejoong	-	-	-	-	[2]13,000	*	-	-
Salehaldin bin Nasron	-	-	-	-	[3]13,000	*	-	-
Lau Chee Ming	-	-	-	-	[3]13,000	*	-	-
Chair Lam Seng	-	-	-	-	[3]13,000	*	-	-

Notes:

* Less than 0.1%.
(1) Based on our enlarged issued share capital of 2,468,274,500 Shares.
(2) Not eligible to subscribe under the Malaysian Public's portion under the Retail Offering but he may subscribe for Excess IPO Shares under the allocation to the Eligible Persons.
(3) Excludes Shares he may subscribe under the Malaysian Public's portion under the Retail Offering and any Excess IPO Shares that he may subscribe under the allocation to the Eligible Persons.

9.2.3 Service contracts with key management

As at the LPD, there is no existing or proposed service contract between our key management and us.

9.2.4 Remuneration of our key management

The aggregate remuneration (including salaries, bonus and allowance and benefits-in-kind) paid or estimated to be paid to our key management for their services for the year ended 31 December 2016 and year ending 31 December 2017 respectively, are as follows:

Remuneration	For the year ended 31 December 2016 (Actual)	For the year ending 31 December 2017 (Estimate)
Salaries	RM250,001 – RM600,000	RM250,001 – RM600,000
Bonus and allowances	RM150,001 – RM600,000	RM200,001 – RM1,400,000
Benefits-in-kind	RM90,001 – RM150,000	RM90,001 – RM150,000

9.2.5 Involvement of our key management in principal business activities outside our Group

Save as disclosed in Section 9.1.3 of this Prospectus and below, as at the LPD, none of our key management is involved in other principal business activities outside our Group:

Key management	Directorships	Principal activities	Involvement in business activities other than as a director
Park Beon Jin	*Present directorship:*		
	• Lotte Ube	• Manufacture and trading of synthetic rubber	• Nil
Kim Daejoong	*Present directorship:*		
	• Lotte Ube (alternate director)	• Manufacture and trading of synthetic rubber	• Nil

The involvement of our key management mentioned above in Lotte Ube is not expected to affect their continued contribution to our Group's management and day-to-day operations, as they are not involved in Lotte Ube's day-to-day activities and operations. They have and will continue to ensure that they will be able to fulfil and discharge their respective duties and responsibilities in our Group effectively.

9.2.6 Management succession plan

We recognise the need to ensure continuity in our management to maintain our Company's competitive edge over our competitors. We have in place human resource strategies which include structured succession planning and retention of high value talent. It secures future leadership capability which is critical for driving organisational performance. In our efforts to ensure business continuity, we take a proactive approach towards addressing talent management to ensure our organisation has talent readily available from a capability perspective to undertake leadership positions throughout the organisation.

The process integrates the identification, assessment and development of talent with long-term strategic planning as follows:

- constantly carrying out employee engagement survey to assess employee satisfaction and effectiveness of leadership and management and identify the underlying issues and obstacles underlying work environment and areas to be improved on;

- identifying key competencies and requirements for managers and higher positions. Job profiles are developed for management position in line with our Group's business goals, strategies and culture; and

- a systematic program to identify potential successors through 360 degree evaluation and competencies assessment. 360 degree evaluation focuses on the employees' behaviors and competencies more than basic skill, job requirements and performance objectives which enables our Group to assess the performance and potential of the employees. Competency is measured based on the individual's pro-activeness, teamwork and cooperation, leadership skills and problem solving skills. Training and improvement program are planned and implemented to support them to achieve both individual effectiveness and leadership to succeed the higher position. Through this program, successors for our key management positions have either been identified or in the process of being identified and are being trained to assume their new roles.

In addition, our middle management are constantly exposed to various aspects of our business activities and job rotation to ensure that they have a full understanding of the responsibilities and the decision making process and are equipped with the knowledge necessary for them to succeed to senior management positions.

9.3 PROMOTER AND SUBSTANTIAL SHAREHOLDERS

9.3.1 Profile of the Promoter and our substantial shareholder, LCC

LCC was incorporated in Korea under the Korean Commercial Act on 16 March 1976 as a private limited company under the name of Honam Petrochemical Corp. before it assumed its present name. On 30 May 1991, LCC was converted into a public limited company and was listed on the Korea Stock Exchange *(now known as Korea Exchange)* on 30 May 1991.

LCC and its subsidiaries are involved in manufacturing and distribution of various petrochemical products whilst LCC's associated companies and jointly-controlled entities are involved in construction, real estate development, chemical production, facility management and natural resource development.

In 2003, LCC acquired Hyundai Petrochemical Corp's Daesan plant in Korea. Following this acquisition, LCC had two complexes in Yeosu and Daesan. In 2004, LCC acquired KP Chemical Corp's Ulsan plant in Korea. Following this acquisition, LCC extended its product portfolio to paraxylene, purified terephthalic acid and polyethylene terephthalate. In 2008, LCC signed a contract to establish UZ-Kor Gas Chemical LLC ("**UZ-Kor**") a joint-venture between LCC, Korean Gas Corporation and Uzbekistan's state-run oil and gas company (Uzbekneftegaz) which was completed in 2015. Uz-Kor is the first Korean petrochemical company to advance into Central Asia. The company produces, HDPE, polypropylene, and methane gas from natural gas in the Surgil complex in Uzbekistan. In 2010, LCC acquired Titan Chemicals Corp. Bhd *(now known as LCT)* to expand its business to Southeast Asia. In 2016, LCC completed its acquisition of Samsung Group's chemical affiliate (currently known as Lotte Advanced Materials and Lotte Fine Chemical Corporation) and diversified its product portfolio by producing acrylonitrile butadiene styrene, solid surface and engineered stone.

LCC has an authorised share capital of KRW5,000,000,000 comprising 100,000,000 shares, of which 34,275,419 shares of KRW5,000 each have been issued and are fully paid-up as at the LPD.

The direct and indirect substantial shareholders of LCC are as follows[1]:

(a) Lotte Corporation

Lotte Corporation was incorporated in the Republic of Korea on 15 June 1982. Its principal activities are:

(i) Real estate rental and supply business;
(ii) Total retail business;
(iii) Wholesale and retail;
(iv) Arts, sports and leisure services; and
(v) Hospitality and restaurant business.

Lotte Corporation operates Lotte World Tower, a 123-storey 555 meter building, and the Lotte World Mall, a shopping mall complex, along with Lotte Shopping and Hotel Lotte in the Jamsil area of Seoul.

(b) Hotel Lotte

Hotel Lotte was incorporated in the Republic of Korea on 5 May 1973. Its principal activities are:

(i) Operation of tourist-class hotels;
(ii) Operation of auxiliary facilities incidental to the management of the tourist-class hotel business;
(iii) Operation of business activities necessary for the management of tourist-class hotels;
(iv) Operation of departmental stores; and
(v) Operation of comprehensive recreational business

Hotel Lotte is divided into four business divisions: the duty-free business division, the hotel business division, the Lotte World business division, and the resort business division.

(c) Lotte Holdings

Lotte Holdings was incorporated in Japan on 28 June 1948. Its principal activities are controlling and managing foreign companies which operate various businesses, through holding their shares.

(d) Kwangyoonsa

Kwangyoonsa was incorporated in Japan on 10 November 1967. Its principal activities are:

(i) Manufacturing and sale of packaging material;
(ii) Manufacturing, sale, export and import of commodities and groceries;
(iii) Sale of domestic and foreign confectionery, food and drink;
(iv) Purchase, sale and lease of real estates;
(v) Agriculture and management of farm;
(vi) Purchase, sale, outsourcing, export and import of ornamental plant, seed, seedlings and bulb;
(vii) Designing and constructing various facilities for landscape gardening and horticulture;
(viii) Manufacturing, sale, export and import of fertiliser, agricultural chemicals, agricultural equipment, gardening tool, gardening soil and carpenter tool;
(ix) Leasing of ornamental plant;
(x) Manufacturing, sale, export and import of textile, toy and convenience goods;
(xi) Printing and bookbinding, and manufacturing, sale, export and import of such products;
(xii) Investment and guarantee;
(xiii) Investment in securities, holding and management of securities; and
(xiv) All businesses relating to the above.

Note:

(1) Based on information extracted from latest available public filings.

For regulatory matters involving our Promoter, LCC, please refer to Sections 9.5 and 5.2.5 of this Prospectus.

9.3.2 Shareholding of the Promoter and our substantial shareholders

The following table sets out the direct and indirect shareholdings of the Promoter and our substantial shareholders before and after our IPO:

	Before our IPO				After our IPO							
					Assuming the Over-allotment Option is not exercised				Assuming the Over-allotment Option is fully exercised			
	Direct		Indirect		Direct		Indirect		Direct		Indirect	
Name	No. of Shares	%	No. of Shares	%	No. of Shares	(1)%	No. of Shares	(1)%	No. of Shares	(1)%	No. of Shares	(1)%
LCC	1,727,791,500	100.0	-	-	1,727,791,500	70.0	-	-	1,672,254,500	67.8	-	-
Lotte Corporation	-	-	(2)1,727,791,500	100.0	-	-	(2)1,727,791,500	70.0	-	-	(2) 1,672,254,500	67.8
Hotel Lotte	-	-	(3)1,727,791,500	100.0	-	-	(3)1,727,791,500	70.0	-	-	(3) 1,672,254,500	67.8
Lotte Holdings	-	-	(3)1,727,791,500	100.0	-	-	(3)1,727,791,500	70.0	-	-	(3) 1,672,254,500	67.8
Kwangyoonsa	-	-	(4)1,727,791,500	100.0	-	-	(4)1,727,791,500	70.0	-	-	(4) 1,672,254,500	67.8

Notes:

(1) Based on our enlarged issued share capital of 2,468,274,500 Shares after our IPO.

(2) Deemed interested by virtue of its shareholding in LCC pursuant to Section 8(4)(c) of the Act.

(3) Deemed interested by virtue of its shareholding in Lotte Corporation pursuant to Section 8(4)(c) of the Act.

(4) Deemed interested by virtue of its shareholding in Lotte Holdings pursuant to Section 8(4)(c) of the Act.

9.3.3 Changes in the Promoter's and our substantial shareholders' shareholdings in our Company for the past three years

There are no changes in the Promoter's and our substantial shareholders' shareholdings in our Company for the past three years up to the LPD.

9.3.4 Involvement of our substantial shareholder in other businesses or corporations which carry on a similar trade as that of our Group or which are our customers and/or suppliers

Both the LCC Group and us are involved in the petrochemical business, as described below:

	LCC Group	Our Group
Markets	Globally with a focus on North America, Latin America, Africa, Europe and North East Asia.	Mainly in Southeast Asia with principal markets being Malaysia and Indonesia.
Products	Polyolefins (HDPE, LLDPE, LDPE and polypropylene), and olefins (ethylene and propylene) and derivatives (butadiene, benzene and toluene). The LCC Group also sells other products such as polycarbonate, polyethylene terephthalate, ethylene glycol, styrene monomer, methyl methacrylate, paraxylene purified terephthalic acid, purified isophthalic acid and acrylonitrile butadiene styrene.	Polyolefins (HDPE, LLDPE, LDPE and polypropylene), and olefins (ethylene and propylene) and derivatives (butadiene, benzene and toluene).

Our Board is of the view that the involvement of LCC in the petrochemical business does not compete directly with our business due to the following:

(i) we sell our products mainly in Southeast Asia with our principal markets being Malaysia and Indonesia because of the zero tariff regime under the ASEAN FTA agreement which is more favourable for us as well as our close proximity to our customers and suppliers which provides us with a natural advantage over LCC as we are able to offer better terms and pricing to customers in the Southeast Asia market;

(ii) we have established long-standing relationships with our customers, spanning more than 10 years. Our customers have become accustomed to our brand name and products which meet their specific needs, in terms of their plants and machineries specifications;

(iii) according to the IMR Report:

  (a) the current demand for polyolefin products is greater than supply and Malaysia and Indonesia is a net importer of polyolefin products;

  (b) for the next two years, demand for polyolefin products will continue to be greater than supply in Malaysia after which RAPID project will commence operations; and

  (c) for the next ten years, demand for polyolefin products will continue to be greater than supply in Indonesia.

Any potential conflict of interest can be mitigated as LCC is not likely to be in a position to compete directly with us given the advantages that we have in respect of the Southeast Asia market as explained in item (i) above; and

(v) LCC and us complement each other in terms of, among others, product offering (by types and grades) and strategy in respect of customers based on proximity to customers. For example, Lotte Chemical Trading Shanghai, a wholly-owned subsidiary of LCC, assists us to promote and market our Group's products (mainly polyolefins) to China by way of an agency agreement. Similarly, we assist the LCC Group in expanding the sales of certain product grades not produced by us in Malaysia. All business arrangements between Lotte Chemical Trading Shanghai and us are conducted on arms' length basis.

In addition, there is and will be sufficient demand for polyolefins in China where as China is expected to be a net importer of polyolefins. According to the IMR Report, high proportion of global consumption growth is still in China. China's total polyolefins demand in 2016 was estimated at approximately 46 million tonnes or approximately 30% of the global market. With the large demand base, Nexant forecasts demand growth levels of polyolefins in China at a cumulative average growth rate of approximately 4.7% over the period 2017-2027. As our polyolefins are commodity petrochemicals, both LCC and us have been able to sell our products in China without competing with each other. Our sales to China for the years ended 31 December 2014, 2015 and 2016 is 9.2%, 13.5% and 11.3% of our total revenue.

LCC's joint-venture, Uz-Kor, is also principally involved in the petrochemical business selling HDPE, polypropylene and methane gas to customers in Central Asia, Turkey, Europe and China. Established in February 2008, it commenced its operations in October 2015 with a plant in Uzbekistan. Our Board is of the view that the involvement of Uz-Kor in the petrochemical business does not compete directly with our business due to the following:

(i) Uz-Kor sells its products mainly in Central Asia while we do not sell any of our products in Central Asia; and

(ii) unlike us, US-Kor extracts natural gas from onshore fields and mainly sells methane gas.

Save as disclosed above, LCC does not have any interest, direct or indirect, in other businesses or corporations which are (i) carrying on a similar trade as that of our Group or (ii) our customers and/or suppliers.

9. INFORMATION ON OUR DIRECTORS, KEY MANAGEMENT, PROMOTER AND SUBSTANTIAL SHAREHOLDERS *(Cont'd)*

9.4 RELATIONSHIPS OR ASSOCIATIONS BETWEEN OUR DIRECTORS, KEY MANAGEMENT, PROMOTER AND SUBSTANTIAL SHAREHOLDERS

Save as disclosed below, there are no family relationships/associations between our Directors, key management, Promoter and substantial shareholders:

(i) Lee Dong Woo, who is our Non-Independent Executive Director and President and Chief Executive Officer, is a representative of LCC, the Promoter and our substantial shareholder, on our Board;

(ii) Lee Kwan Ho, who is our Non-Independent Executive Director, is a representative of LCC, the Promoter and our substantial shareholder, on our Board; and

(iii) Cho Seongtaeg, who is our Non-Independent Non-Executive Director, is also the Chief Financial Controller and a representative of LCC, the Promoter and our substantial shareholder, on our Board.

9.5 DECLARATION BY OUR DIRECTORS, KEY MANAGEMENT AND PROMOTER

None of our Directors, key management or Promoter is and has been involved in any of following events (whether in or outside Malaysia):

(i) a petition under any bankruptcy or insolvency laws was filed (and not struck out) against such person or any partnership in which he was a partner or any corporation of which he was a director or key personnel;

(ii) disqualified from acting as a director of any corporation or from taking part, directly or indirectly, in the management of any corporation;

(iii) charged and/or convicted in a criminal proceeding or is a named subject of a pending criminal proceeding;

(iv) any judgment was entered against such person involving a breach of any law or regulatory requirement that relates to the securities or futures industry; or

(v) the subject of any order, judgment or ruling of any court, government, or regulatory authority or body temporarily enjoining him from engaging in any type of business practice or activity.

Fines imposed by CCM

Our Company had on 30 March 2017 and 31 March 2017 notified CCM about LCTM's and LCT Corporation's non-compliance of Section 136 of the CA 1965 where the companies had paid certain LCC's employees seconded to serve as directors of these companies remuneration that was free of income tax during the period from 2011 to March 2017. CCM had issued compound notices to four of our key management who were directors of LCTM and/or LCT Corporation, as the case may be, when the arrangement had been carried out. Park Beon Jin, David Tan Gek Seng and Philip Kong Chock Hoon were fined RM1,000 each whilst Cheong Peng Khuan was fined RM4,000. The fines had been settled on 3 April 2017.

Fine imposed by the Korea Fair Trade Commission ("KFTC")

On 27 May 2016, the KFTC had imposed a fine of KRW42.3 million (equivalent to approximately RM163,067) on LCC for violating the Monopoly Regulation and Fair Trade Act ("**MRFTA**") when LCC disclosed one of its foreign shareholders as "other shareholder" but not "a person with special interests" in its group's annual announcement for the years 2011, 2012 and 2013 ("**Disputed Violation**"). The counsel acting for LCC ("**LCC Counsel**") is of the view that there was no violation because there is no requirement to disclose a foreign affiliate as a "person with special interests" under the MRFTA. It is also the LCC Counsel's view that the manuals published by KFTC have clearly stated that foreign affiliates are not subject to the jurisdiction of Korean law and are therefore not deemed to be "persons with special interests". Based on the LCC Counsel's advice, LCC had on 9 August 2016 filed an application to the Seoul Central District Court ("**District Court**") appealing against the imposition of the fine. The case is ongoing in the District Court and in the event the District Court's decision goes against LCC, LCC intends to appeal to the Seoul High Court ("**High Court**").

On 22 September 2016, LCC had also received a warning letter from KFTC in relation to the Disputed Violation. Based on the LCC Counsel's advice stated above, LCC had similarly on 28 October 2016 filed an application to the High Court appealing against the warning. However, the High Court had ruled against LCC's appeal on 24 May 2017. LCC is currently reviewing different measures to be taken in response to such ruling by the High Court (including but not limited to appealing to the Supreme Court of Korea).

Civil lawsuit by the Korean Government

On 16 February 2017, the Korean Government filed a civil lawsuit with the Seoul Central District Court against LCC claiming for damages of approximately KRW24.8 billion (equivalent to approximately RM95.6 million) for fraudulent corporate tax refund in relation to the use of impairment losses of KP Chemical Corp, which LCC acquired in 2004. The case is ongoing.

Consumption tax imposed by the National Tax Services of Korea

On 8 December 2016, the head of Yeosu tax office under the National Tax Services of Korea imposed consumption tax of approximately KRW2.8 billion (equivalent to approximately RM10.8 million) against LCC on the grounds of consumption tax evasion in relation to C9, a by-product from its manufacturing process. LCC has appointed Korean counsels to represent it and is disputing this matter in the Tax Tribunal. LCC had, in parallel, filed a lawsuit against the head of Yeosu tax office under the National Tax Services of Korea on the same matter in the Gwang-ju District Court of Korea on 23 May 2017.

For regulatory matters involving certain of LCC's directors, please refer to Section 5.2.5 of this Prospectus.

9.6 OTHER MATTERS

(i) Save as disclosed in Section 9.1.10 of this Prospectus, no other amounts or material benefits has been paid or intended to be paid to the Promoter, our Directors and substantial shareholder within the two years preceding the date of this Prospectus, except for remuneration received by our Directors in the course of their employment and directors' fees, and dividends paid to our shareholders.

(ii) There is no arrangement which operation may result in a change in control of our Company at a date subsequent to our IPO and our Listing.

10. APPROVALS AND CONDITIONS

10.1 APPROVALS AND CONDITIONS

The SC has, via its letter dated 26 May 2017, approved our IPO and our Listing under Section 214(1) of the CMSA and the equity requirement for public listed companies, subject to compliance with the following condition:

Details of condition imposed	Status of compliance
Maybank IB and LCT to fully comply with the requirements of the SC's Equity Guidelines and Prospectus Guidelines pertaining to the implementation of our Listing	Noted

In the same letter, the SC has also noted that the effects of our Listing on the equity structure relating to Bumiputera, non-Bumiputera and foreign shareholdings in our Company arising from the implementation of our IPO would be as follows:

		After our Listing	
Category of shareholders	Before our Listing %	Assuming the Over-allotment Option is not exercised (6)%	(1)Assuming the Over-allotment Option is fully exercised (6)%
Bumiputera			
- MITI approved investors(2)	-	(3)11.50	(3)11.50
- Retail investors	-	(3)1.00	(3)1.00
Non-Bumiputera(4)	-	(5)17.50	(5)19.75
Foreigners – Other investors	-		
Foreigner – LCC	100.00	70.00	67.75
Total	**100.00**	**100.00**	**100.00**

Notes:

(1) Assuming that our IPO Shares under the Over-allotment Option are fully subscribed by non-Bumiputera Malaysians, foreign institutional investors, or a combination of both, and selected investors.

(2) Including government agencies and institutions, Bumiputera individuals, nominee companies and corporations.

(3) Assuming all our Shares allocated to Bumiputera investors under the Retail Offering and Bumiputera investors approved by MITI under the Institutional Offering are fully subscribed.

(4) Assuming all the Eligible Persons who are allocated our IPO Shares under the Retail Offering are non-Bumiputera as the actual subscribers cannot be determined at this juncture.

(5) The amount allocated between the non-Bumiputera investors and other foreigner investors can only be determined after the closing of applications for our IPO Shares.

(6) Percentage of the enlarged issued share capital of our Company.

10. APPROVALS AND CONDITIONS *(Cont'd)*

The SC has, via its letter dated 30 May 2017, approved the reliefs sought by us from having to comply with certain paragraphs of the Equity Guidelines and Prospectus Guidelines. The details of the reliefs sought and the accompanying conditions imposed by the SC are as follows:

Reference	Details of relief granted	Condition imposed (if any)	Status of compliance
Equity Guidelines			
Paragraphs 4(a) and 4(c) of Appendix I	Relief from having to submit to the SC the information as required under paragraphs 4(a) and 4(c) of Appendix I in respect of Kwangyoonsa's direct and indirect shareholders ("**Kwangyoonsa's Shareholders**").	-	N/A
Prospectus Guidelines			
Paragraphs 9.01 and 11.03(a) and (b) of Division 1, Part I	Relief from having to disclose the information as required under paragraphs 9.01, 11.03(a) and (b), in the prospectus, in respect of Kwangyoonsa's Shareholders.	-	N/A
Paragraphs 11.03(a) and (b) of Division 1, Part I	Relief from having to disclose the information as required under paragraphs 11.03(a) and (b), in the prospectus, in respect of Kwangyoonsa, Lotte Holdings, Hotel Lotte and Lotte Corporation.	-	N/A
Paragraph 18.01(g) of Division 1, Part I and Paragraph 1.09(i) of Part II	Relief from having to submit to the SC and making available for inspection the statutory audited financial statements of LCTM for the years ended 31 December 2014 and 2015.	-	N/A

The SAC has, via its letter dated 5 May 2017, classified our Shares as Shariah-compliant securities based on our latest audited financial information for the year ended 31 December 2016.

The MITI has, via its letter dated 27 April 2017, stated that it has taken note and has no objection for us to implement our Listing on the Main Market of Bursa Securities.

Bursa Securities has, via its letter dated 1 June 2017, resolved to approve the admission of our Company to the Official List of the Main Market of Bursa Securities and our Listing.

10.2 MORATORIUM ON THE SALE OF OUR SHARES

Under the Equity Guidelines, our Shares held by our Promoter amounting to 1,727,791,500 Shares representing 70.0% of our enlarged issued share capital (assuming the Over-allotment Option is not exercised) at the date of admission of our Company to the Official List of the Main Market of Bursa Securities will be placed under moratorium.

Our Promoter has fully accepted the moratorium. Our Promoter will not be permitted to sell, transfer or assign of its entire holdings in our Shares under moratorium for six months from the date of our Listing.

The above restriction do not apply:

(i) in respect of our Shares that may be sold under the Over-allotment Option to be granted by our Promoter to the Stabilising Manager (on behalf of the Placement Manager(s)); and

(ii) to the transfer of our Shares by our Promoter as contemplated under the Share Lending Agreement, provided that the restriction will apply to our Shares returned to our Promoter under the Share Lending Agreement.

The above moratorium restrictions are specifically endorsed on the share certificate representing our Shares held by our Promoter which are under moratorium to ensure that our Share Registrar does not register any transfer that contravenes such restrictions.

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST

11.1 RELATED PARTY TRANSACTIONS

Under the Listing Requirements, a "related party transaction" is a transaction entered into by a listed issuer or its subsidiaries which involves the interests, direct or indirect, of a related party. A "related party" of a listed issuer (not being a special purpose acquisition company) is:

(i) a director having the meaning given in Section 2(1) of the CMSA and includes any person who is or was within the preceding six months of the date on which the terms of the transaction were agreed upon, a director of the listed issuer, its subsidiary or holding company or a chief executive of the listed issuer, its subsidiary or holding company; or

(ii) a major shareholder which includes any person who is or was within the preceding six months of the date on which the terms of the transaction were agreed upon, a major shareholder of the listed issuer or its subsidiaries or holding company, who has or had an interest or interests in one or more voting shares in a corporation and the nominal amount of that share or the aggregate of the nominal amounts of those shares is:

  (a) 10% or more of the aggregate of the nominal amounts of all the voting shares in the corporation; or

  (b) 5% or more of the aggregate of the nominal amounts of all the voting shares in the corporation where such person is the largest shareholder of the corporation; or

(iii) a person connected with such director or major shareholder.

Certain transactions, despite falling within the definition of a related party transaction above, are not normally regarded as related party transactions. These are detailed in Paragraph 10.08(11) of the Listing Requirements.

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

11.1.1 Save as disclosed below, there are no material related party transactions that we have entered into with related parties for the years ended 31 December 2014 to 2016 and the year ending 31 December 2017 or up to our next AGM which is expected to be held in June 2018:

(a) material related party transactions with agreements entered into which are once-off or having a term of more than three years:

No.	Date of agreement	Transacting parties	Nature of relationship	Nature of transaction	Transaction value			
					For year ended 31 December			Estimate for year ending 31 December
					2014 (RM'000)	2015 (RM'000)	2016 (RM'000)	2017 (RM'000)
1.	1 September 2011	LCC (payor) and LCTM (payee)	**Interested major shareholders** • LCC • Lotte Corporation • Hotel Lotte • Lotte Holdings • Kwangyoonsa **Interested Directors** • Lee Dong Woo(1) • Kim Gyo Hyun(1) • Lee Kwan Ho(1) • Cho Seongtaeg(1)	Appointment of LCTM by LCC as LCC's agent to promote and market all kinds of polymers and obtain orders from customers in Malaysia. The contract is in force until terminated by either party by giving 60 days' prior written notice or arising from material breach.	102	211	362	400
2.	1 October 2011	LCC (payor) and LCTM (payee)	Please see item 1.	Manufacture of polyethylene and polypropylene products packaged in LCC bags for LCC. The contract is in force until terminated by either party by giving 60 days' prior written notice or arising from material breach.	26,033	22,763	29,092	29,000
3.	18 November 2011	LCC (payor) and LCTM (payee)	Please see item 1.	Payments received from LCC for paying in advance LCC's expenses. The contract is in force until terminated by either party by giving 30 days' prior written notice or arising from material breach.	36	133	48	49

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

No.	Date of agreement	Transacting parties	Nature of relationship	Nature of transaction	Transaction value			
					For year ended 31 December			Estimate for year ending 31 December
					2014	2015	2016	2017
					(RM'000)	(RM'000)	(RM'000)	(RM'000)
4.	19 June 2015	LCC (payee) and LCTM (payor)	Please see item 1.	Provision of engineering, construction and operation services by LCC on a three year contract. LCTM does not intend to extend the contract after the expiry of the three-year period.	-	2,660	7,388	2,126
5.	20 December 2016	LCC (payee) and LCTM (payor)	Please see item 1.	Provision of engineering, construction and operation services by LCC on a three year contract.	-	-	-	4,900
6.	15 May 2015	LCC (payee) and LCTM (payor)	Please see item 1.	Provision of information technology consulting services by LCC.	-	273	-	-
7.	31 May 2012	LCC(buyer) and LCT Trading (seller)	Please see item 1.	Sale of LDPE to LCC. The contract is in force until terminated by either party by giving 60 days' prior written notice or arising from material breach. This has been terminated with effect from 1 January 2017 and replaced by Item 10.	36,423	37,988	47,012	-

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

No.	Date of agreement	Transacting parties	Nature of relationship	Nature of transaction	Transaction value			
					For year ended 31 December			Estimate for year ending 31 December
					2014	2015	2016	2017
					(RM'000)	(RM'000)	(RM'000)	(RM'000)
8.	1 January 2014	LCC (payee) and LCT Trading (payor)	Please see item 1.	Appointment of LCC as agent to promote and market all kinds of polymers produced by the LCT Group in countries including but not limited to Hong Kong, Latin America and Russia. The contract is in force until terminated by either party by giving 60 days' prior written notice or arising from material breach. This has been terminated with effect from 1 January 2017 and replaced by Item 11.	491	541	534	-
9.	1 July 2013	LCC (licensor) and LCTM and LCT Trading (licensees)	Please see item 1.	Grant of non-exclusive licence to manufacture polypropylene products (grade name JM-370K and L-670M) and use the technical information and intellectual property rights in Indonesia, Malaysia, Singapore, Thailand and Philippines and China by LCC. The contract is in force until terminated by either party by giving 60 days' prior written notice or arising from substantial failure to perform. This has been terminated with effect from 1 January 2017 and replaced by Item 12.	205	618	788	-

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

No.	Date of agreement	Transacting parties	Nature of relationship	Nature of transaction	Transaction value			
					For year ended 31 December			Estimate for year ending 31 December
					2014	2015	2016	2017
					(RM'000)	(RM'000)	(RM'000)	(RM'000)
10.	1 March 2017	LCC (buyer) and LCT Corporation (seller)	Please see item 1.	Sale of LDPE to LCC. The contract is in force until terminated by either party by giving 60 days' prior written notice or arising from material breach.	-	-	-	45,000
11.	1 March 2017	LCC (payee) and LCT Corporation (payor)	Please see item 1.	Appointment of LCC as agent to promote and market all kinds of polymers produced by the LCT Group in countries including but not limited to Hong Kong, Latin America and Russia. The contract is in force until terminated by either party by giving 60 days' prior written notice or arising from material breach.	-	-	-	500
12.	1 March 2017	LCC (licensor) and LCTM and LCT Corporation (licensees)	Please see item 1.	Grant of non-exclusive licence to manufacture polypropylene products (grade name JM-370K and L-670M) and use the technical information and intellectual property rights in Indonesia, Malaysia, Singapore, Thailand and Philippines and China by LCC. The contract is in force until terminated by either party by giving 60 days' prior written notice or arising from material breach.	-	-	-	800

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

No.	Date of agreement	Transacting parties	Nature of relationship	Nature of transaction	Transaction value			
					For year ended 31 December			Estimate for year ending 31 December
					2014	2015	2016	2017
					(RM'000)	(RM'000)	(RM'000)	(RM'000)
13.	29 September 2014	Lotte E&C Malaysia Sdn Bhd (borrower) and LCTM (lender)	**Interested major shareholders** • LCC[2] • Lotte Corporation[2] • Hotel Lotte[2] • Lotte Holdings[2] • Kwangyoonsa[2] **Interested Directors** • Lee Dong Woo[1] • Kim Gyo Hyun[1] • Lee Kwan Ho[1] • Cho Seongtaeg[1]	Provision of loan to Lotte E&C Malaysia Sdn Bhd ("**LECM Loan**") guaranteed by Lotte E&C. The loan was repaid in 2015.	11,488	3,000	-	-
14.	3 February 2016	Lotte E&C Malaysia Sdn Bhd (payee) and LCTM (payor)	Please see item 13.	Construction and pre-commissioning of the TE3 Project by Lotte E&C Malaysia Sdn Bhd.	-	-	218,192	163,702
15.	24 December 2015	Lotte E&C (payee) and LCTM (payor)	**Interested major shareholders** • LCC[3] • Lotte Corporation[3] • Hotel Lotte[3] • Lotte Holdings[3] • Kwangyoonsa[3] **Interested Directors** • Lee Dong Woo[1] • Kim Gyo Hyun[1][8] • Lee Kwan Ho[1] • Cho Seongtaeg[1]	Provision of procurement service for equipment and bulk materials for the TE3 Project by Lotte E&C.	-	-	362,435	137,687

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

No.	Date of agreement	Transacting parties	Nature of relationship	Nature of transaction	Transaction value			
					For year ended 31 December			Estimate for year ending 31 December
					2014	2015	2016	2017
					(RM'000)	(RM'000)	(RM'000)	(RM'000)
16.	22 February 2016	Lotte E&C (payee) and LCTM (payor)	Please see item 15.	Provision of procurement service for compressor and replacement turbines by Lotte E&C.	-	-	96,435	5,453
17.	1 March 2011	Lotte Chemical Trading Shanghai Corp (payee) and LCT Trading (payor)	**Interested major shareholders** • LCC[4] • Lotte Corporation[4] • Hotel Lotte[4] • Lotte Holdings[4] • Kwangyoonsa[4] **Interested Directors** • Lee Dong Woo[1] • Kim Gyo Hyun[1] • Lee Kwan Ho[1] • Cho Seongtaeg[1]	Appointment of Lotte Chemical Trading Shanghai Corp as agent to market and sell polyethylene and polypropylene products produced by the LCT Group in China. The contract is in force until terminated by either party by giving 60 days' prior written notice or arising from material breach. This appointment has been terminated with effect from 1 January 2017 and replaced by Item 18.	2,140	3,643	2,976	-
18.	28 December 2016	Lotte Chemical Trading Shanghai Corp (payee) and LCT Corporation (payor)	Please see item 17.	Appointment of Lotte Chemical Trading Shanghai Corp as stockist and agent to sell polyethylene and polypropylene produced by the LCT Group in China. The contract is in force until terminated by either party by giving 60 days' prior written notice or arising from material breach.	-	-	-	3,000

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

No.	Date of agreement	Transacting parties	Nature of relationship	Nature of transaction	Transaction value			
					For year ended 31 December			Estimate for year ending 31 December
					2014	2015	2016	2017
					(RM'000)	(RM'000)	(RM'000)	(RM'000)
19.	15 March 2013	Lotte Ube (lessee) and LCTM (lessor)	**Interested major shareholders** • LCC[5] • Lotte Corporation[5] • Hotel Lotte[5] • Lotte Holdings[5] • Kwangyoonsa[5] **Interested Directors** • Lee Dong Woo[1] • Kim Gyo Hyun[1] • Lee Kwan Ho[1] • Cho Seongtaeg[1]	30 year lease over part of HSD 310853, PT No. PTD 2855, in the Mukim of Sungai Tiram, Johor Bahru, Johor granted to Lotte Ube.	403	506	630	681
20.	20 August 2013	Lotte Ube (payor) and LCTM (payee)	Please see item 19.	Provision of administrative operations, engineering and information technology services to Lotte Ube. The contract is in force until terminated due to material breach, dissolution or liquidation or by LCTM when LCT is no longer a shareholder of Lotte Ube and subsidiary of LCC or UBE Industries Ltd is no longer a shareholder of Lotte Ube. This has been terminated with effect from 1 January 2017 and replaced by Items 27 and 28.	67	241	572	-

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

No.	Date of agreement	Transacting parties	Nature of relationship	Nature of transaction	Transaction value			
					For year ended 31 December			Estimate for year ending 31 December
					2014	2015	2016	2017
					(RM'000)	(RM'000)	(RM'000)	(RM'000)
21.	20 November 2013	LCT (guarantor) and Bank of Tokyo-Mitsubishi UFJ (Malaysia) Berhad, who is the lender for facilities granted to Lotte Ube)	Please see item 19.	Provision of guarantee and indemnity ("**Guarantee**") by LCT in favour of Bank of Tokyo-Mitsubishi UFJ (Malaysia) Berhad for an amount of up to 10% of Lotte Ube's debt and liability owing to Bank of Tokyo-Mitsubishi UFJ (Malaysia) Berhad in relation to facilities granted.	250	248	198	198
22.	10 December 2013	LCC, Lotte Ube (payor) and LCT (payee) (as well as other parties, namely, UBE Industries Ltd and Mitsubishi Corporation)	Please see item 19.	Receipt of fees from Lotte Ube for the provision of the Guarantee.	48	54	57	57
23.	19 March 2015	Lotte Ube (payor) and LCTM (payee)	Please see item 19.	Repayment of investment cost for construction of pipeline for Lotte Ube's use. The contract is in force for the duration of the butadiene purchase agreement for the sale of butadiene referred to in item 26.	-	345	1,407	1,514
24.	19 March 2015	Lotte Ube (payor) and LCTM (payee)	Please see item 19.	Supply of industrial water, electricity, high pressure steam, fire water and flare to Lotte Ube. The contract is in force until terminated due to event(s) of default.	2,440	11,024	7,205	9,476

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

No.	Date of agreement	Transacting parties	Nature of relationship	Nature of transaction	Transaction value			
					For year ended 31 December			Estimate for year ending 31 December
					2014	2015	2016	2017
					(RM'000)	(RM'000)	(RM'000)	(RM'000)
25.	19 March 2015	Lotte Ube (buyer) and LCTM (seller)	Please see item 19.	Sale of butadiene to Lotte Ube for 20 years commencing from 19 March 2015. This has been novated by LCTM to LCT Corporation with effect from 1 January 2017. Please see item 26.	3,309	69,751	69,538	-
26.	27 February 2017	Lotte Ube (buyer) and LCT Corporation (seller)	Please see item 19.	Sale of butadiene to Lotte Ube from 1 January 2017 until 18 March 2035.	-	-	-	381,229
27.	3 February 2017	Lotte Ube (payor) and LCT Corporation (payee)	Please see item 19.	Provision of finance, human resources, legal and corporate secretary and information technology related services to Lotte Ube. The contract is in force until terminated due to material breach, dissolution or liquidation or by LCT Corporation when LCT is no longer a shareholder of Lotte Ube and subsidiary of LCC or UBE Industries Ltd is no longer a shareholder of Lotte Ube.	-	-	-	50

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

No.	Date of agreement	Transacting parties	Nature of relationship	Nature of transaction	Transaction value			
					For year ended 31 December			Estimate for year ending 31 December
					2014	2015	2016	2017
					(RM'000)	(RM'000)	(RM'000)	(RM'000)
28.	3 February 2017	Lotte Ube (payor) and LCTM (payee)	Please see item 19.	Provision of administrative, environmental, fire safety, security, procurement and maintenance and engineering services to Lotte Ube. The contract is in force until terminated due to material breach, dissolution or liquidation or by LCTM when LCT is no longer a shareholder of Lotte Ube and subsidiary of LCC or UBE Industries Ltd is no longer a shareholder of Lotte Ube.	-	-	-	600
29.	1 September 2014	PT Lotte Data Communication Indonesia ("**PT LDCC Indonesia**") (payee) and PT LCT Nusantara (payor)	**Interested major shareholders** • Hotel Lotte(6) • Lotte Holdings(6) • Kwangyoonsa(6) **Interested Directors** • Lee Dong Woo(1) • Kim Gyo Hyun(1) • Lee Kwan Ho(1) • Cho Seongtaeg(1)	Provision of internet service at PT LCT Nusantara's Jakarta office by PT LDCC Indonesia. The contract is in force until terminated due to, among others, failure to perform.	11	30	31	30

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

No.	Date of agreement	Transacting parties	Nature of relationship	Nature of transaction	Transaction value			
					For year ended 31 December			Estimate for year ending 31 December
					2014	2015	2016	2017
					(RM'000)	(RM'000)	(RM'000)	(RM'000)
30.	21 April 2016	LC USA (issuer) and LCT (investor)	**Interested major shareholders** • LCC[7] • Lotte Corporation[7] • Hotel Lotte[7] • Lotte Holdings[7] • Kwangyoonsa[7] **Interested Directors** • Lee Dong Woo[1] • Kim Gyo Hyun[1] • Lee Kwan Ho[1] • Cho Seongtaeg[1]	Purchase of 80 shares of common stock in LC USA from LC USA	-	-	USD342.8 million (equivalent to RM1,477,639)	-
31.	21 April 2016	LCC, LC USA and LCT	Please see item 30.	Stockholders agreement setting out the rights and obligations of LC USA, LCC and LCT.	-	-	-	-
32.	24 March 2017	LC USA (issuer) and LCT (investor)	Please see item 30.	Purchase of 40 shares of common stock in LC USA from LC USA.	-	-	-	USD168.0 million (equivalent to RM724,164)

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

No.	Date of agreement	Transacting parties	Nature of relationship	Nature of transaction	Transaction value			
					For year ended 31 December			Estimate for year ending 31 December
					2014	2015	2016	2017
					(RM'000)	(RM'000)	(RM'000)	(RM'000)
33.	10 May 2017	LC USA (borrower), LCC (guarantor), LCT (negative pledge provider), Mizuho Bank, Ltd., Los Angeles Branch (facilities agent) and HSBC Bank USA, National Association (collateral agent)	Please see item 30.	Provision of negative pledge in relation to LC USA's syndicated term loan facility from banks by LCT where LCT will not, among others, create, incur or permit to subsist any lien over any of its right or interest in its 40% equity interests in LC USA.	-	-	-	USD510.8 million (equivalent to RM2,201,803)

Notes:

(1) Lee Dong Woo, Lee Kwan Ho and Cho Seongtaeg are LCC's representatives on our Board. Kim Gyo Hyun is a former director of our Company. He resigned from our Board on 31 March 2017.

(2) LCC, Lotte Corporation, Hotel Lotte, Lotte Holdings and Kwangyoonsa are our major shareholders. Lotte E&C Malaysia Sdn Bhd is a wholly-owned subsidiary of Lotte E&C which in turn is 33.9% held by LCC. As such, LCC, Lotte Corporation, Hotel Lotte, Lotte Holdings and Kwangyoonsa are common major shareholders of our Company and Lotte E&C Malaysia Sdn Bhd.

(3) LCC, Lotte Corporation, Hotel Lotte, Lotte Holdings and Kwangyoonsa are our major shareholders. Lotte E&C is 33.9% owned by LCC. As such, LCC, Lotte Corporation, Hotel Lotte, Lotte Holdings and Kwangyoonsa are common major shareholders of our Company and Lotte E&C.

(4) LCC, Lotte Corporation, Hotel Lotte, Lotte Holdings and Kwangyoonsa are our major shareholders. Lotte Chemical Trading Shanghai Corp is a wholly owned subsidiary of LCC. As such, LCC, Lotte Corporation, Hotel Lotte, Lotte Holdings and Kwangyoonsa are common major shareholders of our Company and Lotte Chemical Trading Shanghai Corp.

(5) LCC, Lotte Corporation, Hotel Lotte, Lotte Holdings and Kwangyoonsa are our major shareholders. Lotte Ube is 40% held by LCC and 10% held by our Company. As such, LCC, Lotte Corporation, Hotel Lotte, Lotte Holdings and Kwangyoonsa are common major shareholders of our Company and Lotte Ube.

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

(6) Hotel Lotte, Lotte Holdings and Kwangyoonsa are our major shareholders. Lotte Data Communication Company Ltd ("**Lotte Data**") is 2.9% held by Hotel Lotte and 34.5% held by Lotteria Co. Ltd which in turn is 18.8% held by Hotel Lotte. PT LDCC Indonesia is a wholly-owned subsidiary of Lotte Data. As such, PT LDCC Indonesia is a person connected to our major shareholders, Hotel Lotte, Lotte Holdings and Kwangyoonsa.

(7) LCC, Lotte Corporation, Hotel Lotte, Lotte Holdings and Kwangyoonsa are our major shareholders. Lotte Chemical USA Corporation is 60% held by LCC and 40% is held by our Company. As such, LCC, Lotte Corporation, Hotel Lotte and Lotte Holdings are common major shareholders of our Company and LC USA.

(b) material related party transactions with agreements entered into having a term of three years or less or transacted on an ad-hoc basis:

No.	Transacting parties	Nature of relationship	Nature of transaction	Transaction value			
				For year ended 31 December			Estimate from 1 January 2017 up to next AGM
				2014 (RM'000)	2015 (RM'000)	2016 (RM'000)	(RM'000)
1.	LCC (payor) and PT LCT Nusantara (payee)	**Interested major shareholders** • LCC • Lotte Corporation • Hotel Lotte • Lotte Holdings • Kwangyoonsa **Interested Directors** • Lee Dong Woo(1) • Kim Gyo Hyun(1) • Lee Kwan Ho(1) • Cho Seongtaeg(1)	Consignment of trial of LCC's catalyst to PT LCT Nusantara to produce a specific type of polyethylene (Metallocene) and sale of a portion of the products by PT LCT Nusantara to LCC under contracts with a term of less than a year.	2,754	13,791	5,608	14,256
2.	LCC (seller) and LCTM (buyer)	Please see item 1.	Purchase of goods, namely LDPE and catalyst, from LCC on an ad-hoc basis.	2,320	2,512	4,911	7,367

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

No.	Transacting parties	Nature of relationship	Nature of transaction	Transaction value			
				For year ended 31 December			Estimate from 1 January 2017 up to next AGM
				2014 (RM'000)	2015 (RM'000)	2016 (RM'000)	(RM'000)
3.	LCC Group (payee) and LCT Group (payor)	Please see item 1.	Provision of information technology services by the LCC Group. The contracts are for terms not exceeding a year with subsequent automatic annual renewals unless terminated by either party giving three months prior written notice or in the case of consultancy services until the information technology system is implemented.	44	62	60	107
4.	LCC Group (buyer) and LCT Group (seller)	Please see item 1.	Sale of goods, namely polyethylene and polypropylene to the LCC Group on an ad-hoc basis.	68,077	79,322	66,527	132,987

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

No.	Transacting parties	Nature of relationship	Nature of transaction	Transaction value For year ended 31 December 2014 (RM'000)	2015 (RM'000)	2016 (RM'000)	Estimate from 1 January 2017 up to next AGM (RM'000)
5.	Lotte Data (payee) and LCT Group (payor)	**Interested major shareholders** • Hotel Lotte(2) • Lotte Holdings(2) • Kwangyoonsa(2) **Interested Directors** • Lee Dong Woo(1) • Kim Gyo Hyun(1) • Lee Kwan Ho(1) • Cho Seongtaeg(1)	Provision of information technology services, server rental, information technology systems and licences by Lotte Data. The contracts for: (a) the information technology services are for terms not exceeding a year and where applicable, with subsequent automatic annual renewals unless terminated by either party giving a month's prior written notice; (b) the server rental are for terms not exceeding a year; (c) the information technology systems are until the systems are implemented; and (d) the licences are for purchases on an ad-hoc basis.	2,111	3,337	2,362	5,176
6.	Lotte E&C (payee) and LCTM (payor)	**Interested major shareholders** • LCC(3) • Lotte Corporation(3) • Hotel Lotte(3) • Lotte Holdings(3) • Kwangyoonsa(3) **Interested Directors** • Lee Dong Woo(1) • Kim Gyo Hyun(1) • Lee Kwan Ho(1) • Cho Seongtaeg(1)	Engineering services for the construction of pipeline for the supply of butadiene by Lotte E&C on an ad-hoc basis.	1,770	243	-	-

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

No.	Transacting parties	Nature of relationship	Nature of transaction	Transaction value For year ended 31 December 2014 (RM'000)	2015 (RM'000)	2016 (RM'000)	Estimate from 1 January 2017 up to next AGM (RM'000)
7.	PT Lotte Logistics Indonesia (payee) and PT LCT Tbk (payor)	**Interested major shareholders** • Hotel Lotte(4) • Lotte Holdings(4) • Kwangyoonsa(4) **Interested Directors** • Lee Dong Woo(1) • Kim Gyo Hyun(1) • Lee Kwan Ho(1) • Cho Seongtaeg(1)	Provision of warehouse, logistics and customs clearance for imported goods (being polyethylene and polypropylene purchased by PT LCT Tbk from LCTM) by PT Lotte Logistics Indonesia. The contract is for a year with an option for PT LCT Tbk to extend for a year by giving three months prior written notice.	-	-	1,336	2,751

Notes:

(1) Lee Dong Woo, Lee Kwan Ho and Cho Seongtaeg are LCC's representatives on our Board. Kim Gyo Hyun is a former director of our Company. He resigned from our Board on 31 March 2017.

(2) Hotel Lotte, Lotte Holdings and Kwangyoonsa are our major shareholders. Lotte Data is 2.9% held by Hotel Lotte and 34.5% held by Lotteria Co. Ltd which in turn is 18.8% held by Hotel Lotte. As such, Lotte Data is a person connected to our major shareholders, Hotel Lotte, Lotte Holdings and Kwangyoonsa.

(3) LCC, Hotel Lotte, Lotte Holdings and Kwangyoonsa are our major shareholders. Lotte E&C is 33.9% owned by LCC. As such, LCC, Lotte Corporation, Hotel Lotte, Lotte Holdings and Kwangyoonsa are common major shareholders of our Company and Lotte E&C.

(4) Lotte Hotel, Lotte Holdings and Kwangyoonsa are our major shareholders. PT Lotte Logistics Indonesia is 99% held by Lotte Logistics Co., Ltd which is 17.3% held by Lotteria Co. Ltd. which in turn is 18.8% held by Hotel Lotte. As such, PT Lotte Logistics Indonesia is a person connected to our major shareholders, Hotel Lotte, Lotte Holdings and Kwangyoonsa.

Our Directors confirm that these related party transactions were carried out on an arm's length basis and on normal commercial terms which are not more favourable to the related parties than those generally available to third parties and are not detrimental to our minority shareholders.

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

11.1.2 Our Group intends to enter into the following proposed material related party transaction for the year ending 31 December 2017:

No.	Transacting parties	Nature of relationship	Nature of proposed transaction	Transaction value Estimate for year ending 31 December 2017 (RM'000)
1.	LCC (payee) and LCT Corporation (payor)	**Interested major shareholders** • LCC • Lotte Corporation • Hotel Lotte • Lotte Holdings • Kwangyoonsa **Interested Directors** • Lee Dong Woo(1) • Kim Gyo Hyun(1) • Lee Kwan Ho(1) • Cho Seongtaeg(1)	Provision of management and consulting services by LCC.	18,810

Note:

(1) Lee Dong Woo, Lee Kwan Ho and Cho Seongtaeg are LCC's representatives on our Board. Kim Gyo Hyun is a former director of our Company. He resigned from our Board on 31 March 2017.

Our Directors confirm that this related party transaction will be carried out on an arm's length basis and on normal commercial terms which will not be more favourable to the related parties than those generally available to third parties and will not be detrimental to our minority shareholders.

11.1.3 Transactions entered into that are unusual in their nature or conditions

There are no unusual transactions in their nature or conditions, involving goods, services, tangible or intangible assets to which we were a party in respect of the past three years ended 31 December 2014 to 2016 and the financial period up to the LPD.

11.1.4 Outstanding loans and guarantees

Save as disclosed in Section 11.1.1(a) (item 21) of this Prospectus, there are no outstanding loans (including guarantees of any kind) made by our Group to or for the benefit of our related parties in respect of the past three years ended 31 December 2014 to 2016 and the financial period up to the LPD.

11.2 CONFLICTS OF INTEREST

11.2.1 Audit and Risk Management Committee review

Our Audit and Risk Management Committee reviews any related party transaction and conflict of interest that may arise within our Group. Our Audit and Risk Management Committee periodically reviews the procedures set by our Company to monitor related party transactions to ensure that these transactions are carried out on arm's length basis and normal commercial terms not more favourable to the related party than those generally available to third parties and are not to the detriment of our Company's minority shareholders. All reviews by our Audit and Risk Management Committee are reported to our Board for its further action.

11.2.2 Monitoring and oversight of related party transactions and conflicts of interest

Related party transactions, by their very nature, involve a conflict of interest between our Group and the related parties with whom our Group has entered into such transactions. Some of our Group's officers and our Directors are also officers, directors and in some cases, shareholders of the related parties of our Group, as disclosed in this Prospectus and, with respect to these related party transactions, may individually and in aggregate have conflicts of interest. It is the policy of our Group not to enter into transactions with related parties unless these transactions are carried out on normal commercial terms not more favourable to the related party than those generally available to third parties dealing at arm's length with our Group and are not to the detriment of our Company's minority shareholders.

11.3 DECLARATION BY ADVISERS ON CONFLICTS OF INTEREST

11.3.1 Declaration by Maybank IB

Maybank IB and its related and associated companies ("**Maybank Group**") form a diversified financial group and are engaged in a wide range of investment and commercial banking, brokerage, securities trading, assets and funds management and credit transaction services businesses. The Maybank Group has engaged and may in the future, engage in transactions with and perform services for our Company and/or our affiliates, in addition to the roles set out in this Prospectus. In addition, in the ordinary course of business, any member of the Maybank Group may at any time offer or provide its services to or engage in any transaction (on its own account or otherwise) with any member of our Group, our shareholders and/or their affiliates and/or any other entity or person, hold long or short positions in securities issued by our Company and/or our affiliates, and may trade or otherwise effect transactions for its own account or the account of its customers in debt or equity securities or senior loan of any member of our Group and/or our affiliates. This is a result of the businesses of the Maybank Group generally acting independently of each other, and accordingly, there may be situations where parts of the Maybank Group and/or its customers now have or in the future, may have interest or take actions that may conflict with the interest of our Group.

Nonetheless, the Maybank Group is required to comply with applicable laws and regulations issued by the relevant authorities governing its advisory business, which require, among others, segregation between dealing and advisory activities and Chinese wall between different business divisions.

As at 30 May 2017, our Group has subsisting trade lines, foreign exchange facilities with a combined limit of RM741.8 million and equity swap arrangements with the Maybank Group whereby the Maybank Group receives fees and income from the said facilities. Pursuant to the equity swap arrangements, entities within the Maybank Group may, from time to time, as part of their ordinary course of business, transact in the shares of PT LCT Tbk, our indirect subsidiary listed on the Indonesia Stock Exchange. As at the LPD, Maybank IB holds 4.4% equity interest in PT LCT Tbk.

Notwithstanding the foregoing, Maybank IB has confirmed that the aforesaid business relationship would not give rise to a conflict of interest situation in its capacity as Principal Adviser for our IPO, the Joint Global Coordinator and the Joint Bookrunner for the Institutional Offering as well as the Managing Underwriter and the Joint Underwriter for the Retail Offering as:

(i) the extension of credit facilities and the entering into equity swap arrangements with corporate clients are in the ordinary course of business of the Maybank Group;

(ii) the conduct of the Maybank Group in its banking business is strictly regulated by among others, the Financial Services Act, 2013, Islamic Financial Services Act, 2013 and the Maybank Group's own internal control and checks; and

(iii) the total aggregate outstanding amount owed by our Group to the Maybank Group of RM123.9 million as at 30 May 2017 is not material when compared to the audited NA of the Maybank Group as at 31 December 2016 of RM68.5 billion.

Maybank IB has also confirmed that there is no conflict of interest situation in its capacity as Principal Adviser for our IPO, the Joint Global Coordinator and the Joint Bookrunner for the Institutional Offering as well as the Managing Underwriter and the Joint Underwriter for the Retail Offering.

11.3.2 Declaration by Credit Suisse

Credit Suisse AG, together with its affiliates, branches and subsidiaries (together, the "**Credit Suisse Group**"), comprise a full service financial services provider engaged in securities trading, brokerage activities as well as investment banking and financial advisory services. In the ordinary course of trading and brokerage activities, members of the Credit Suisse Group may hold positions for its own account or the accounts of its customers, in equity, debt or other securities of members of our Group.

The Credit Suisse Group may engage in transactions with, and perform services for our Group in the ordinary course of business and has engaged, and may in the future engage, in commercial banking and investment banking transactions, including providing loans or entering into other financing arrangements, with our Group, for which the Credit Suisse Group has received, or may in the future receive, customary compensation.

Having regard to the foregoing, Credit Suisse confirms that there is no conflict of interest in its capacity as the Joint Global Coordinator and Joint Bookrunner in our IPO as the Credit Suisse Group has not made any loan to our Company (to the knowledge of the Credit Suisse) and Credit Suisse will not receive any proceeds from our IPO, except with respect to the fees and expenses incurred by Credit Suisse in connection with its role as the Joint Global Coordinator and the Joint Bookrunner for the Institutional Offering in relation to our IPO.

11.3.3 Declaration by J.P. Morgan

J.P. Morgan and/or its subsidiaries, branches, affiliates and associates (the "**J.P. Morgan Group**"), in its capacity as principal or agent, is and may in the future, be involved in a wide range of commercial banking and investment banking activities globally (including investment advisory, asset management, wealth management, research, securities issuance, trading (customer and proprietary) and brokerage) from which conflicting interests or duties may arise. The J.P. Morgan Group has engaged, and may in the future engage, in transactions with, and has performed, and may in the future perform, services for members of our Company, in addition to the roles set out in this Prospectus.

In addition, in the ordinary course of its global investment banking and commercial banking activities, J.P. Morgan and other members of the J.P. Morgan Group may at any time offer or provide services to or engage in any transaction (on its own account or otherwise) with members of our Company and/or any other persons, or hold long or short positions, and may trade or otherwise effect transactions, for its own account or the accounts of its customers, in debt or equity securities (or related derivative instruments) or senior loans of members of our Company.

J.P. Morgan has confirmed that notwithstanding the above, it does not have a conflict of interest which prevents it from acting in its capacity as the Joint Global Coordinator and the Joint Bookrunner for the Institutional Offering in relation to our IPO.

11.3.4 Declaration by Adnan Sundra & Low

Adnan Sundra & Low has confirmed that there is no conflict of interest in its capacity as the legal adviser to LCT as to Malaysian law in relation to our IPO.

11.3.5 Declaration by Clifford Chance Pte Ltd

Clifford Chance Pte Ltd has confirmed that there is no conflict of interest in its capacity as the legal adviser to LCT as to United States federal securities and English law in relation to our IPO.

11.3.6 Declaration by Kadir Andri & Partners

Kadir Andri & Partners has confirmed that there is no conflict of interest in its capacity as the legal adviser to the Joint Global Coordinators, the Joint Bookrunners, the Managing Underwriter and the Joint Underwriters as to Malaysian law in relation to our IPO.

11.3.7 Declaration by Cleary Gottlieb Steen & Hamilton LLP

Cleary Gottlieb Steen & Hamilton LLP has confirmed that there is no conflict of interest in its capacity as the legal adviser to the Joint Global Coordinators and the Joint Bookrunners as to United States federal securities and English law in relation to our IPO.

11.3.8 Declaration by Ernst & Young

Ernst & Young has confirmed that there is no conflict of interest in its capacity as the Auditors and Reporting Accountants in relation to our IPO.

11.3.9 Declaration by Nexant

Nexant has confirmed that there is no conflict of interest in its capacity as the Independent Market Research Consultant in relation to our IPO.

11.3.10 Declaration by CIMB

CIMB, its related and associated companies, as well as its holding company CIMB Group Holdings Berhad and the subsidiaries and associated companies of its holding company ("**CIMB Group**") form a diversified financial group and are engaged in a wide range of transactions relating to amongst others, retail banking, investment banking, commercial banking, brokerage, securities trading, asset and funds management and credit transaction services business. The CIMB Group has engaged and may in the future, engage in transactions with and perform services for our Company and/or our affiliates, in addition to the roles set out in this Prospectus.

In addition, in the ordinary course of business, any member of the CIMB Group may at any time offer or provide its services to or engage in any transactions (on its own account or otherwise) with any member of our Company and/or our affiliates, and/or any other entity or person, hold long or short positions in securities issued by our Company and/or our affiliates, make investment recommendations and/or publish or express independent research views on such securities, and may trade or otherwise effect transactions for its own account or the account of its other customers in debt or equity securities or senior loans of our Company and/or our affiliates. This is a result of the businesses of the CIMB Group generally acting independently of each other, and accordingly there may be situations where parts of the CIMB Group and/or its clients now have or in the future, may have interests or take actions that may conflict with the interests of our Company.

CIMB has confirmed that there is no conflict of interest in its capacity as the Joint Underwriter and Joint Bookrunner in relation to our IPO.

11.3.11 Declaration by HSBC

HSBC has confirmed that there is no conflict of interest in its capacity as Joint Bookrunner for the Institutional Offering outside Malaysia in relation to our IPO.

11.3.12 Declaration by Nomura

Nomura and its affiliates (collectively, the "**Nomura Group**") are engaged in a wide range of financial services and businesses (including, without limitation, advisory services, asset and investment management, securities and derivatives trading, financing, investment banking and research). Each member of the Nomura Group provides such services and pursues such businesses for its own account and for the account of its respective clients. As with other global financial institutions, in the ordinary course of their businesses, the members of the Nomura Group and their respective clients may now or in the future have interests or take actions that conflict with the interests of our Company, which may include, among other things, holding long or short positions in debt, equity or other securities of our Company or our affiliates. In order to address such potential conflicts of interest, the Nomura Group has procedures to identify when a conflict arises that could adversely affect the services that the Nomura Group provides to its clients.

Based on such procedures, Nomura has confirmed that it does not have a conflict of interest which prevents it from acting in its capacity as the Joint Bookrunner for the Institutional Offering outside Malaysia in relation to our IPO.

11.3.13 Declaration by Affin Hwang Investment Bank Berhad

Affin Hwang Investment Bank Berhad has confirmed that there is no conflict of interest which prevents it from acting in its capacity as the Joint Underwriter in relation to our IPO.

11. RELATED PARTY TRANSACTIONS AND CONFLICTS OF INTEREST *(Cont'd)*

11.3.14 Declaration by MIDF Amanah Investment Bank Berhad

MIDF Amanah Investment Bank Berhad has confirmed that there is no conflict of interest which prevents it from acting in its capacity as the Joint Underwriter in relation to our IPO.

12. FINANCIAL INFORMATION

12.1 HISTORICAL FINANCIAL INFORMATION

12.1.1 Selected historical consolidated financial data

The following selected historical consolidated financial data for the years ended 31 December 2014 to 2016 have been extracted from the Accountants' Report included in Section 13 of this Prospectus.

The following selected historical consolidated financial data should be read in conjunction with the "Management's Discussion and Analysis of Financial Condition, Results of Operations For The Years Ended 31 December 2014, 2015 and 2016 and Prospects" in Section 12.2 of this Prospectus and the Accountants' Report in Section 13 of this Prospectus.

	Audited		
	Year ended 31 December		
	2014	2015	2016
	(RM'000)	(RM'000)	(RM'000)
Selected consolidated statement of comprehensive income data:			
Revenue	8,611,229	8,147,847	8,136,628
Cost of goods sold	(8,375,064)	(6,828,703)	(6,154,673)
Gross profit	236,165	1,319,144	1,981,955
Other income	17,239	27,011	13,442
Distribution expenses	(104,754)	(107,087)	(102,193)
Administrative expenses	(73,823)	(87,009)	(87,770)
Foreign exchange differences	(1,233)	(84,731)	(21,126)
Fair value changes on derivatives	2,398	28,143	(5,418)
Other expenses	(18,139)	(21,694)	(56,161)
Profit from operations	57,853	1,073,777	1,722,729
Finance income	1,796	3,835	7,855
Finance costs	(41,074)	(22,883)	(15,076)
Net finance costs	(39,278)	(19,048)	(7,221)
Share of results of associates	(770)	(4,552)	(5,314)
Profit before tax	17,805	1,050,177	1,710,194
Income tax	(38,020)	(436,108)	(394,114)
Net (loss)/profit for the year	(20,215)	614,069	1,316,080
Net (loss)/profit for the year attributable to:			
Owner of the Company	(19,198)	613,211	1,315,386
Non-controlling interests	(1,017)	858	694
	(20,215)	614,069	1,316,080

	Audited		
	Year ended 31 December		
	2014	2015	2016
	(RM'000)	(RM'000)	(RM'000)
Selected consolidated statement of financial position data:			
Non-current assets	3,761,713	3,767,346	5,978,747
Current assets	2,280,798	3,569,695	3,361,744
Total assets	**6,042,511**	**7,337,041**	**9,340,491**
Share capital	1,727,792	1,727,792	1,727,792
Share premium	294,113	294,113	294,113
Other reserves	434,308	1,539,547	1,943,750
Retained earnings	2,147,477	2,660,402	3,981,743
Total equity attributable to owner of the Company	4,603,690	6,221,854	7,947,398
Non-controlling interests	8,227	10,790	22,022
Total equity	**4,611,917**	**6,232,644**	**7,969,420**
Non-current liabilities	458,509	426,636	705,326
Current liabilities	972,085	677,761	665,745
Total liabilities	**1,430,594**	**1,104,397**	**1,371,071**
Other selected financial data:			
Gross profit margin (%)[(1)]	2.7	16.2	24.4
Depreciation of property, plant and equipment	338,996	420,959	398,363
Amortisation of prepaid lease payments	1,231	1,984	2,147
EBITDA[(2)]	398,080	1,496,720	2,123,239
EBITDA margin[(3)]	4.6%	18.4%	26.1%
Profit before tax margin (%)[(4)]	0.2	12.9	21.0
(Loss)/profit after tax margin (%)[(5)]	(0.2)	7.5	16.2
Basic and diluted (loss)/earnings per ordinary share (sen)[(6)]	(1.11)	35.49	76.13

Notes:

(1) Computed based on gross profit divided by revenue.

(2) Computed based on profit from operations plus depreciation of property, plant and equipment and amortisation of prepaid lease payments.

(3) Computed based on EBITDA divided by revenue.

(4) Computed based on profit before tax divided by revenue.

(5) Computed based on net (loss)/profit for the year divided by revenue.

(6) Computed based on loss for the year attributable to owner of the Company of RM19.2 million for the year ended 31 December 2014 and profit for the year attributable to owner of the Company of RM613.2 million and RM1,315.4 million for the years ended 31 December 2015 and 2016 respectively against our weighted average number of ordinary shares outstanding for the past three years of 1,727,792,000.

12.2 MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS FOR THE YEARS ENDED 31 DECEMBER 2014, 2015 AND 2016 AND PROSPECTS

The following discussion and analysis should be read in conjunction with the Accountants' Report included in Section 13 of this Prospectus.

This discussion and analysis contains forward-looking statements that reflect our current views with respect to future events and our financial performance. Our actual results may differ materially from those anticipated in these forward-looking statements as a result of any number of factors, including those set out in "Risk Factors" and "Forward-Looking Statements" of this Prospectus.

In the context of our operations, references to "domestic market" refer to the Malaysian market for products produced by our Malaysian plants, and the Indonesian market for products produced by our Indonesian plant.

12.2.1 Overview

We are an integrated petrochemical producer with two principal product categories, namely:

(i) polyolefins, comprising polyethylene and polypropylene; and

(ii) olefins, comprising ethylene and derivatives such as butadiene, TBA, benzene and toluene.

Polyolefins are used to produce a variety of consumer and industrial products including packaging film, trash bags, automotive parts, plastic bottles and caps, compounds for wire and cable insulation, while olefins are used as primary feedstock for the production of polyolefin products. For the year ended 31 December 2016, polyolefin product sales accounted for 80% of our total revenue.

In 2016, we represented 53% capacity share in polyethylene production and 100% capacity share in polypropylene production in Malaysia as well as a 57% capacity share in polyethylene production in Indonesia. We are the fourth largest producer of polyolefin products in Southeast Asia by production capacity in 2016, with a 42% capacity share in olefins production in Malaysia and 29% capacity share in polyolefin production in Indonesia.

We own and operate 14 plants in Malaysia and Indonesia. Our plants are supported by on-site facilities such as co-generation plants, tank farms and waste water treatment facilities across Malaysia and Indonesia. These on-site facilities lower our costs of production and reduce our dependency on external utility suppliers.

12.2.2 Significant factors affecting our financial condition and results of operations

A number of factors affect our financial condition and results of operations, including the significant factors set out below that have affected our results during the years under review, which we expect will continue to affect our results in the future:

(i) Cyclicality in the petrochemical industry

The petrochemical industry and the operating margins in this industry have historically been cyclical. Changes in supply and demand, both domestically and internationally (including in Southeast Asia, China and other markets we sell to), and resulting utilisation rates are key factors that influence the cycle and profitability of the petrochemical industry.

Supply is affected by significant capacity additions in the market, and if such additions are not matched by corresponding growth in demand, average industry utilisation rates and margins will face downward pressures. Conversely, if capacity additions are not able to keep up with increased demand, average industry utilisation rates and margins face upward pressure. As a result, the petrochemical industry is cyclical and characterised by periods of tight supply, leading to high utilisation rates and margins, followed by periods of oversupply primarily resulting from significant capacity additions, leading to reduced utilisation rates and margins. The demand and supply balance may favour one position or the other for an extended period of time and may not rebalance quickly.

As the petrochemical industry is cyclical, new investments usually occur at the same time, following periods of sustained higher profitability. Cyclical changes in supply and demand are usually closely linked to economic growth patterns, especially in China given its strong manufacturing base. Global supply is increasing, with renewed investments in the United States following increased shale gas availability, adding to the development of capacity in the Middle East and Asia, led by investments in China.

It is not possible to predict accurately the supply and demand balances, market conditions and other factors that may affect industry capacity utilisation rates and margins in the future.

(ii) Economic conditions in Asia, in particular Malaysia and Indonesia

The overall macroeconomic conditions in Asia, in particular Malaysia and Indonesia, impact our operations because demand for our products is driven by end customers across a diverse range of industries whose businesses are dependent on the state of the economy.

Malaysia

During 2014, 2015 and 2016, Malaysia's GDP grew at 6.0%, 5.0% and 4.3%, respectively, with GDP growth in 2015 and 2016 affected by low commodity prices, depreciation of the RM, and a generally weaker global environment. The Malaysian economy is expected to achieve an estimated GDP growth of about 4.5% over the next three years, from 2017 to 2019, as it continues to develop higher value and higher margin businesses, including increasing exports of petrochemicals.

In 2016, Malaysia's olefins capacity stood at around 2.8 million tonnes per year, making up 14% of the total olefins capacity in Southeast Asia. The majority of olefins production is consumed domestically for the production of polyolefins and other products produced from ethylene. Lower domestic fuel prices due to the decline in global crude oil prices, implementation of minimum wages and the government's efforts to nurture a skilled country workforce is likely to support growth in domestic consumption.

Indonesia

Indonesian GDP growth has averaged 4.9% per year in the past three years, between 2014 and 2016. The oil and gas sector contributes about 20% of the country's revenues.

In the longer term, Indonesia's economic outlook remains positive and is assumed by Nexant to continue leading consumption growth in Southeast Asia, based on forecast GDP growth. In view of plans put in place by the Indonesian government such as infrastructure development and improvements in social assistance programmes in education and healthcare, the manufacturing sector is likely to continue to grow, driving polyolefin demand in Indonesia.

For further information on the economic environment of Malaysia and Indonesia, please refer to Section 5.4.1 of this Prospectus.

(iii) Prices of feedstock

Feedstock cost is the largest component of our cost of goods sold, accounting for about 88.0%, 79.2% and 78.1% of our cost of goods sold for the years ended 31 December 2014, 2015 and 2016, respectively. Naphtha and ethylene make up the largest and second-largest components of our feedstock costs, respectively.

We use naphtha as our primary feedstock to produce other types of feedstock for our plants such as ethylene and propylene. We do not produce all of our naphtha-derived feedstock internally. For example, while our naphtha crackers produce substantially all of the ethylene and propylene requirements of our Malaysian polyolefin plants, as well as a portion of the ethylene requirements for our Indonesian plants, we do not have the capacity to produce enough ethylene to fully meet the requirements of our Indonesian plants. We supplement our internal ethylene production with ethylene purchases from external parties for our Indonesian plants. We also occasionally purchase propylene, pygas, catalysts and other chemicals from third-party suppliers in the market through international trading houses, on a spot basis.

Feedstock prices generally reflect trends in market prices for crude oil (as liquid-based feedstock are products of crude oil or substitutable for crude oil products), and demand and supply of these feedstock. However, there may be a time delay between crude oil price changes and corresponding feedstock price changes. In general, crude oil prices have been declining since 2014. In 2015, crude oil prices remained consistent between the range of USD40 to USD60 per barrel, as OPEC and non-OPEC countries competed for market share through continued production. However, significant cost reductions for shale oil production in the United States and Iran's increased crude oil production following the removal of sanctions against it in January 2016 led to further oversupply in the market, causing crude oil prices to fall below USD30 per barrel in the first quarter of 2016. Since then, crude oil prices have risen again to between USD40 and USD60 per barrel, supported by OPEC and non-OPEC decisions to cut production towards the end of the year.

As naphtha and ethylene are international commodities whose prices depend on the price of crude oil, their prices are typically denominated in USD. Primarily as a result of the decline in crude oil prices, our average purchase prices for naphtha and ethylene decreased significantly from 2014 to 2015 and again from 2015 to 2016 in USD terms. Although our average purchase price of ethylene decreased in USD terms from 2015 to 2016, our average ethylene price increased from 2015 to 2016 in RM terms due to a depreciation of the RM against the USD. For more information, please refer to Section 12.2.2(vi) of this Prospectus.

The following table sets out our average purchase price by type of feedstock for the years indicated.

	Year ended 31 December		
	2014	**2015**	**2016**
	RM per MT		
Naphtha	2,986	1,870	1,583
Ethylene	4,652	4,189	4,226

(iv) Prices of our products

Our revenue, gross margin and profit depend on the prices of our products, which are sensitive to supply and demand dynamics in both the domestic and international commodities markets. Most of our products are of a commoditised nature and competition among manufacturers of these products is based principally on price.

The prices of our products are determined largely by:

(a) market demand and supply, which are generally linked to the level of economic activity in Malaysia, Indonesia, the United States and globally as well as by production capacity available in the market;

(b) feedstock prices, as we generally pass changes in feedstock price directly to our customers by changing the price of our products, although the amount of time it takes for us to pass changes in feedstock price directly to our customers depends on our product mix, market conditions and customer demand for the product in question;

(c) quality, grade and application of the products we produce; and

(d) location of the purchaser, as our domestic prices are typically higher than our export prices due to the speed of delivery to our domestic customers' facilities, our provision of other value-added services through our PTC (such as development of process solutions custom-made to the requirement of our domestic customers) and the granting of credit terms to our domestic customers.

Prices of our products are closely linked to international prices and are typically priced on the following basis:

Product		Benchmark price
Polyethylene	:	Monthly prices are set based on ICIS for CFR Southeast Asia and Platts prices, as well as other Southeast Asian producers' offers in the market
Polypropylene	:	Monthly prices are set based on ICIS for CFR Southeast Asia and Platts prices, as well as other Southeast Asian producers' offers in the market
Ethylene	:	ICIS for CFR Southeast Asia, plus or minus a differential depending on the supply agreement
Butadiene	:	Platts' assessment for FOB. Korea or CFR Taiwan, ICIS's assessment for CFR Northeast Asia or Southeast Asia plus or minus a differential depending on the supply agreement
Benzene	:	Platts' assessment for FOB. Korea plus or minus a differential depending on the supply agreement
Toluene	:	ICIS-LOR assessment for CFR Southeast Asia plus or minus a differential depending on the supply agreement

Prices for the majority of our polyolefin products include logistics and transportation costs incurred in the delivery of these products.

The following table sets out a breakdown of our average sales price by product type for the years indicated. Polyethylene Malaysia prices and polyethylene Indonesia prices reflect prices of polyethylene produced from our plants in Malaysia and Indonesia, respectively.

	Year ended 31 December							
	Bench-mark price[1]	Average sales price	Bench-mark price[1]	Average sales price	Bench-mark price[1]	Average sales price	% change from 2014 to 2015	% change from 2015 to 2016
	2014		2015		2016			
	(RM per MT, except percentages)							
Polyolefin Products								
Polypropylene[2]	4,888	5,394	4,270	4,754	4,059	4,573	(11.9%)	(3.8%)
Polyethylene Malaysia	5,042	5,325	4,762	4,995	4,799	4,981	(6.2%)	(0.3%)
Polyethylene Indonesia	5,042	5,337	4,762	5,124	4,799	5,075	(4.0%)	(1.0%)
Olefins and Derivative Products[2]								
Ethylene	4,568	4,282	4,244	4,197	4,321	4,157	(2.0%)	(1.0%)
Propylene	4,047	4,125	3,034	-[3]	2,986	-[3]	(100.0%)	-
Benzene	3,984	3,942	2,687	2,621	2,668	2,596	(33.5%)	(1.0%)
Toluene	-[4]	3,583	-[4]	2,696	-[4]	2,561	(24.8%)	(5.0%)
Butadiene[5]	4,179	4,134	3,419	3,486	4,660	4,398	(15.7%)	26.2%
TBA	-[4]	2,529	-[4]	2,053	-[4]	1,904	(18.8%)	(7.3%)
By-products[6]	-[4]	2,724	-[4]	1,933	-[4]	1,695	(29.0%)	(12.3%)

Notes:

(1) The benchmark prices is extracted from the IMR Report and translated to RM using the exchange rates as set out in Section 12.2.2(vi) of this Prospectus. Our sales prices are determined based on various factors as explained above.

(2) Produced from our plants in Malaysia.

(3) We did not have any propylene sales in 2015 and 2016 as it was more profitable for us to use the propylene which we produced as feedstock for our polypropylene production.

(4) Information is not available in the IMR Report.

(5) Despite the decrease in feedstock prices, our average sales price of butadiene increased largely due to demand in China and India for synthetic rubber, a product made from butadiene.

(6) Our by-products comprise primarily pygas, fuel oil, light cycle oil, C4 Raffinate-2, mixed aromatics and C5 Non Aromatics.

Beginning with the year ended 31 December 2014, there was a steady decrease in the average sales prices of polyolefins, olefins and derivative products, primarily due to the fall in crude oil prices starting in 2014, which resulted in a significant fall in feedstock prices. This has generally negatively impacted our revenue for the year ended 31 December 2014, 2015 and 2016, which decreased from RM8,611.2 million to RM8,147.8 million and to RM8,136.6 million. However, the time gap between the decrease in feedstock prices and the decrease in our average sales prices has resulted in a significant increase in our gross profit for the year ended 31 December 2014, 2015 and 2016 from RM236.2 million to RM1,319.1 million and to RM1,982.0 million.

(v) Plant capacity and utilisation

The production capacity of our plants and the rates at which we run our plants directly impacts our production volumes and sales. Our production capacity primarily depends on maintenance works and debottlenecking projects on our plants. We incur capital expenditures on such projects in order to improve our production capacity.

Our major debottlenecking projects in 2016 have resulted in additional capacity of our PP1 and PP2 Plants by 16 KTA and 34 KTA, respectively. For further information on plant capacity and utilisation, please refer to Section 7.6.5 of this Prospectus.

We have two new projects under construction, namely our TE3 Project and the PP3 Project, which we expect to commence commercial operations in the second half of 2017 and second half of 2018, respectively. We expect the TE3 Project to increase our production capacity of ethylene by 93 KTA and propylene by 170 KTA, and the PP3 Project to increase our production capacity of polypropylene by 200 KTA. While our increased licensed nameplate capacity in relation to propylene is 127 KTA, we plan to re-commence operations for our OCU Plant after completion of the TE3 Project, depending on the market prices of ethylene and propylene then. As a result, our propylene capacity may increase by a further 43 KTA, taking the total increased propylene capacity to 170 KTA.

We capitalise the project costs of new projects, and depreciate the project costs once the projects are completed. As a result, we expect to experience significant increases in our depreciation and amortisation expenses in the years ending 31 December 2017 and 31 December 2018 as we expect to commence depreciating and amortising the project costs for TE3 Project and PP3 Project in the second half of 2017 and second half of 2018, respectively after the completion of these projects.

Generally, plant utilisation rates are affected by shutdowns, which in turn affect production volumes at our facilities. Shutdowns particularly affect production levels because it takes about two weeks for our plants to return to optimal efficiency. Shutdowns take place either as part of a scheduled maintenance or due to occurrences such as emergency power outages, interruptions in water supply, technical failures, accidents, natural disasters, regulatory rulings and emergency corrective maintenance. For instance, there were shutdowns of our plants, as follows:

(a) an emergency shutdown in October 2014 due to a power outage which led to a decrease of the annual volume output by 42 KTA for the year ended 31 December 2014. For further information on the incident, please refer to Section 7.12 of this Prospectus; and

(b) a period of shutdown in April 2017 due to an interruption in water supply which led to a decrease in our production volume by approximately 75 KT. For further information on the incident, please refer to Section 7.6.18 of this Prospectus.

We shut down our plants periodically for scheduled maintenance, and for longer periods of maintenance and turnaround every three to six years, depending on business conditions and the type of plant. We aim to shutdown our plants for maintenance and turnaround based on a scheduled timeline to minimise disruptions to our deliveries and other operations. For example, we stagger the maintenance for our two crackers so that they are not shut down at the same time. This allows us to run some of our Malaysian plants even if one cracker is shut down. We undertook the most recent turnaround on our naphtha crackers from February to March 2017 for our NC2 Plant, as a result of which this plant and most of our other plants in Malaysia were shut down for a period ranging from 13 days to 56 days, due to, among others, disruption in supply of feedstock from the NC2 Plant to the other plants. We have also scheduled to perform a turnaround for our NC1 Plant in July 2017 which we expect will take about 33 days.

(vi) Foreign exchange fluctuations

Although our reporting currency is the RM, the functional currency of our main operating subsidiaries is USD as substantially all of our feedstock purchases and all of our sales outside Malaysia and Indonesia are denominated in USD. However, other than feedstock purchases, most of our expenses and sales in Malaysia are denominated in RM, and most of our expenses and sales in Indonesia are denominated in IDR. Even though we transact our business, other than feedstock purchases, in Malaysia and Indonesia in local currencies, the sales prices of most of our products are based on international pricing benchmarks denominated in USD. Accordingly, we are generally able to adjust our product prices to reflect the appreciation or depreciation of the RM and IDR against the USD, though we may not be able to do so immediately. For this reason, to a large extent we benefit from a natural hedge that reduces the impact of foreign exchange fluctuations on our gross profit.

We have significant assets and liabilities denominated in RM and IDR that we then convert to USD for purposes of preparing our financial statements in our functional currency which is USD. Fluctuations of the RM and IDR against USD can have a significant effect on the carrying value of certain assets and liabilities, in particular trade and other receivables, trade and other payables and deferred tax assets and liabilities. Consequently, foreign exchange fluctuations can, and have in the past, materially affect our profit. For example, a depreciation of the RM against the USD from 2014 to 2015 led to a decrease in the value of our deferred tax assets, which are primarily denominated in RM, when converted into our functional currency of USD, resulting in a substantial charge to deferred tax expense in 2015.

We recognise the following differences in foreign exchanges in our financial statements:

(i) strengthening or weakening of the USD against the RM/IDR from the transaction date to the settlement date of the transaction, which is recognised as realised foreign exchange losses or gains respectively;

(ii) strengthening or weakening of the USD against the RM/IDR from the transaction date to the year end, which is recognised as unrealised foreign exchange losses or gains respectively; and

(iii) differences arising from the translation of our financial statements from our functional currency of the USD to our reporting currency of RM, which is recognised as foreign currency translation differences under our other comprehensive income.

The RM has depreciated significantly against the USD in the last three years, which has negatively impacted our results of operations. For example, the depreciation of the RM against USD in the year ended 31 December 2015 contributed to both realised and unrealised foreign exchange losses of RM55.0 million and RM29.7 million, respectively.

The following table sets out the RM-to-USD exchange rates that we used to prepare our financial statements for the years indicated.

	Year ended 31 December		
	2014	**2015**	**2016**
Statement of comprehensive income	3.3	3.8	4.1
Statement of financial position	3.5	4.3	4.5

We had in the past entered into cross-currency swaps to mitigate our exposure to foreign exchange rate fluctuations. In 2010, we entered into a five-year cross-currency rate swap contract ("**Cross-Currency Swap**") with Standard Chartered Bank Jakarta Branch ("**SCB**"). We entered into the Cross-Currency Swap to manage our exposure against currency exchange rate fluctuations in relation to our IDR-denominated bond and IDR-denominated *Sukuk Ijarah* (Islamic bond) ("***Sukuk***") to partially hedge our risk of the IDR strengthening against the USD. The maturity date of the Cross-Currency Swap was in June 2015, to coincide with the maturity date of the bond and *Sukuk*, with interest settled quarterly. We recognised the fair value of the Cross-Currency Swap as an asset or liability on our statements of financial position. The fair value changes on the Cross-Currency Swap are recognised as income or expenses in our statement of comprehensive income on a monthly basis.

(vii) Tax incentives and credits

We enjoy tax incentives in Malaysia such as the ITA and the PHI. Currently, we do not enjoy any tax incentives in Indonesia.

ITA

ITA is an incentive granted by the Malaysian government to qualifying projects. In 2004, our subsidiary LCTM obtained the approval of the Ministry of Finance for the ITA on qualifying capital expenditure for the production of ethylene, propylene, pygas, fuel oil, benzene, toluene, xylene, LLDPE, HDPE, LDPE, polypropylene and butadiene (collectively, "**Qualifying Products**"). For corporate income tax purposes, the ITA can be used to offset all of the business income derived from the Qualifying Products. Any unutilised ITA can be carried forward to set off business income from Qualifying Products in subsequent years until fully utilised. We are subject to tax on any profit derived from non-Qualifying Products.

We did not utilise any ITA deduction in the year ended 31 December 2014 because we had sufficient capital allowances to offset against our taxable income for that year. In the year ended 31 December 2015, we had utilised RM606 million of ITA to offset against our taxable income. As at the LPD, tax assessments for the year ended 31 December 2016 has not yet been finalised, therefore in the year ended 31 December 2016, we estimate to utilise about RM1,850 million of ITA to offset against our taxable income in Malaysia. After taking into account the estimated utilisation for the year ended 31 December 2016, we estimate that we have RM838 million of unutilised ITA available as at 31 December 2016, which we can utilise in subsequent years until fully utilised.

Once we have fully utilised our ITA, we expect to begin paying taxes, which may affect our cash flows and result in a significant decrease in net profit after tax.

IPC

IPC is an incentive granted to an eligible company which carries on a business in Malaysia to undertake procurement and sale of raw materials, components and finished products to its group of related companies and to unrelated companies in Malaysia and abroad.

In 2006, MIDA granted IPC status to LCT Trading, entitling it to a full tax exemption of its statutory income for a 10-year period commencing from 1 January 2007 under Section 127 of the Income Tax Act, 1967 of Malaysia.

The activities undertaken by LCT Trading under the IPC are procurement and sale of finished products which include ethylene, propylene, benzene, toluene, butadiene, HDPE, LDPE, LLDPE, homopolymer PP, copolymer PP, TBA and by-product such as mixed xylenes, light cycle oil and C4 Raffinate -2.

To qualify for the tax incentive, LCT Trading must ensure that, among others, it complies with the following:

- its gross turnover is at least RM100 million;
- at least 80% of its gross turnover must be derived from export (including 30% via drop shipment); and
- sales to the domestic market are limited to 20% of its turnover.

In the years ended 31 December 2014 and 2015, RM173.1 million and RM147.4 million of our income was exempted from tax under the IPC incentive scheme.

We estimate that our tax exempt income under the IPC incentive scheme for the year ended 31 December 2016 would be RM139.4 million. As at the LPD, tax assessments for the year ended 31 December 2016 have not yet been finalised.

The tax incentive had expired on 31 December 2016.

PHI

PHI is a tax incentive introduced under the 2015 Malaysian Budget and established by MIDA on 1 May 2015. PHI is an incentive granted to an eligible company that uses Malaysia as a base for conducting its regional and global businesses and operations to manage, control and support its key functions including management of risks, decision making, strategic business activities, trading, finance, management and human resources.

Our wholly-owned subsidiary, LCT Corporation, received the approval for the PHI from MIDA on 11 November 2016. Under the PHI, LCT Corporation is entitled to:

- full income tax exemption on the trading income and service income, arising from its qualifying activities for a period of five years commencing 1 January 2017; and
- a tax rate of 10% on the trading income and service income arising from its qualifying activities for a period of five years commencing 1 January 2022.

To qualify for the incentive, the eligible company is required to carry out at least three qualifying services in the area of:

- strategic services such as regional profit and loss/business unit management and strategic business planning and corporate development;
- business services such as sales and marketing as well as strategic sourcing, procurement and distribution; and
- shared services such as finance and accounting and corporate training and human resource management.

One of the qualifying services must be from the strategic services cluster.

The qualifying services undertaken by LCT Corporation under the PHI include:

(i) management services to related companies;

(ii) overseeing the sales function of LCT's Indonesian subsidiaries;

(iii) strategic feedstock sourcing and procurement;

(iv) corporate and strategic planning; and

(v) provision of human resource talent management to related companies.

To qualify for the tax incentive, LCT Corporation must also ensure that, among others, it complies with the following:

(i) registering minimum annual sales turnover of RM300 million; and

(ii) income derived from domestic sales of goods and services does not exceed 30% of the total income derived from sale of goods and services for the relevant financial year.

In addition, following the expected completion of our TE3 Project in the second half of 2017, our wholly-owned subsidiary, LCTM, is planning to make its first Reinvestment Allowance ("**RA**") claim in 2017 on the qualifying capital expenditure ("**QCE**") incurred on our TE3 Project. Please refer to Annexure C(2).1(vi) of this Prospectus for more information on the RA.

12.2.3 Significant accounting estimates and judgements

In preparing our financial statements, we are required to make judgments, estimates and assumptions that affect the reported amounts of revenues, expenses, assets and liabilities and the disclosure of contingent liabilities at the reporting date. However, uncertainty about these assumptions and estimates could result in outcomes that could require a material adjustment to the carrying amount of the asset or liability affected in the future.

The key judgements, key assumptions concerning the future and other key sources of estimation uncertainty at the reporting date that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are discussed below:

(a) Estimated useful lives of property, plant and equipment

We regularly review the estimated useful lives of our property, plant and equipment based on factors such as business plan and strategies, expected level of usage and future technology developments. Future results of operations could be materially affected by changes in these estimates brought about by changes in the factors mentioned above. A reduction in the estimated useful lives of property, plant and equipment would increase the recorded depreciation and decrease the value of property, plant and equipment.

(b) Deferred tax assets

We recognise deferred tax assets for all deductible temporary differences, unused tax losses and unused tax credits to the extent that it is probable that future taxable profits will be available against which the deductible temporary differences, unused tax losses and unused tax credits to be utilised. Significant management judgment is required to determine the amount of deferred tax assets that can be recognised, based upon the likely timing and level of future taxable profits together with future tax planning strategies.

(c) Provisions

We recognise a provision for dismantling and removing our manufacturing facilities from our leased sites. In determining the amount of the provision, assumptions and estimates are made in relation to the discount rate applied, expected dismantling and removal costs (which will incorporate expected future inflation rates), and expected timing of those costs. These estimated future costs of decommissioning are reviewed annually and adjusted as appropriate.

(d) Inventories

Inventories are written down based on an assessment of their net realisable value. When estimating the net realisable value of inventories, we consider all the facts relating to the inventories and the operating environment at the time the estimates are made. Where the actual realised values of the inventories differ from the original estimate, such differences will be taken to profit or loss in the period in which the inventories are sold.

(e) Investment in associate

An associate is an entity, not being a subsidiary or a joint venture, in which we have a significant influence. In 2012, we acquired a 10% equity stake in Lotte Ube. Based on the agreed arrangement between the shareholders of Lotte Ube, Lotte Ube's board of directors shall consist of six directors, of which we are entitled to appoint one director. We are also a key supplier of raw materials and utilities to Lotte Ube. Given the above, we have judged that we are able to exercise significant influence over Lotte Ube and have accordingly accounted for our investment in Lotte Ube as an associate.

12.2.4 Results of operations

(i) Overview

The following discussion of our results of operations with respect to the years ended 31 December 2014, 2015 and 2016 is based on, and should be read in conjunction with the Accountants' Report included in Section 13 of this Prospectus.

(ii) Revenue

We derive revenue from sales of the following:

(a) polyolefins products, which include polyethylene and polypropylene; and

(b) olefins and derivatives products, which include ethylene, propylene, benzene, toluene, butadiene, TBA and by-products comprising of pygas, fuel oil, light cycle oil, C4 Raffinate-2, mixed aromatics and C5 Non Aromatics.

We also had a one-off sale of naphtha in 2015 which was recognised as revenue within our olefins and derivatives products segment.

Total revenue represents the invoiced value of products delivered. Please refer to Section 7.7 of this Prospectus on details of the terms of payment for our products.

A portion of our ethylene supply to our Indonesian plants in 2015 and 2016 was carried out through a sales and purchase arrangement with a trading house ("**Third Party Ethylene Arrangement**"). As the trading house is our contractual counterparty to this arrangement, we recognise revenue from the sale of ethylene to the trading house, and we recognise cost of goods sold from the purchase of ethylene from the same trading house.

Revenue by product type

The following table sets out a breakdown of our revenue by product type and the percentage these revenues represent as a proportion of total revenue for the years indicated. Polyethylene Malaysia revenues and polyethylene Indonesia revenues reflect revenues from the sale of polyethylene produced from our plants in Malaysia and Indonesia, respectively.

	Year ended 31 December					
	2014		2015		2016	
	(RM million, except percentages)					
Polyolefin Products						
Polypropylene[1]	1,947.7	22.6%	1,951.6	24.0%	1,876.4	23.1%
Polyethylene Malaysia	2,908.3	33.8%	2,908.7	35.7%	2,840.4	34.9%
Polyethylene Indonesia	1,927.6	22.4%	1,639.8	20.1%	1,762.5	21.7%
Total polyolefins	**6,783.6**	**78.8%**	**6,500.1**	**79.8%**	**6,479.3**	**79.7%**

	Year ended 31 December					
	2014		2015		2016	
	(RM million, except percentages)					
Olefins and Derivative Products[1]						
Ethylene[2]	80.5	0.9%	204.8	2.5%	261.9	3.2%
Propylene	6.6	0.1%	-[3]	0.0%	-[3]	0.0%
Benzene	296.8	3.4%	226.7	2.8%	245.1	3.0%
Toluene	145.1	1.7%	132.1	1.6%	107.8	1.3%
Butadiene	309.6	3.6%	294.6	3.6%	383.1	4.7%
TBA	173.0	2.0%	170.8	2.1%	154.8	1.9%
By-products[4]	816.0	9.5%	618.7	7.6%	504.6	6.2%
Total Olefins and Derivative Products	**1,827.6**	**21.2%**	**1,647.7**	**20.2%**	**1,657.3**	**20.3%**
Total revenue	**8,611.2**	**100.0%**	**8,147.8**	**100.0%**	**8,136.6**	**100.0%**

Notes:

(1) Produced from our plants in Malaysia.

(2) Includes revenue from ethylene that we sold through the Third Party Ethylene Arrangement.

(3) We did not have any propylene sales in 2015 and 2016 as it was more profitable for us to use the propylene which we produced as feedstock for our internal operations.

(4) Our by-products primarily comprise of pygas, fuel oil, light cycle oil, C4 Raffinate-2, mixed aromatics and C5 Non Aromatics.

Revenue by geographical market

The following table sets out a breakdown of our revenue by geographical market based on the location of delivery, and the percentage these revenues represent as a proportion of total revenue, for the years indicated.

	Year ended 31 December					
	2014		2015		2016	
	(RM million, except percentages)					
Malaysia	3,313.2	38.5%	3,102.6	38.1%	3,149.5	38.7%
Indonesia	2,506.4	29.1%	2,349.3	28.8%	2,316.7	28.5%
China (including Hong Kong)	788.0	9.2%	1,099.7	13.5%	923.2	11.3%
Southeast Asia[1]	1,054.4	12.2%	857.3	10.5%	789.7	9.7%
Others[2]	949.2	11.0%	738.9	9.1%	957.5	11.8%
Total revenue	**8,611.2**	**100.0%**	**8,147.8**	**100.0%**	**8,136.6**	**100.0%**

Notes:

(1) Excluding Malaysia and Indonesia.

(2) Others include the ISC, Northeast Asia, North America, Africa and Oceania.

(iii) Cost of goods sold

Our cost of goods sold consists primarily of:

(a) cost of feedstock and other materials, primarily naphtha and ethylene, and to a lesser extent propylene, butene, hexene, catalysts and other chemicals;

(b) utilities and supplies, including primarily costs for natural gas, electricity, water, nitrogen, steam and packaging materials;

(c) fixed manufacturing costs, including payroll, plant overhead, repair and maintenance and plant insurance;

(d) depreciation and amortisation of our property, plant and equipment used in the production process; and

(e) net changes in inventories, which represents the difference between the value of inventory at the beginning of the year and the value of inventory at the end of the year.

The following tables set out the key components of our cost of goods sold and the percentage they represent as a proportion of total cost of goods sold for the years indicated.

	Year ended 31 December					
	2014		2015		2016	
	(RM million, except percentages)					
Feedstock and other materials	7,368.3	88.0%	5,408.0	79.2%	4,805.4	78.1%
Utilities and supplies	522.9	6.3%	595.7	8.7%	652.7	10.6%
Fixed manufacturing costs	212.2	2.5%	269.9	4.0%	292.4	4.8%
Depreciation and amortisation	312.9	3.7%	387.2	5.7%	369.1	5.9%
Net changes in inventories	(41.2)	(0.5%)	167.9	2.4%	35.1	0.6%
Total cost of goods sold	**8,375.1**	**100.0%**	**6,828.7**	**100.0%**	**6,154.7**	**100.0%**

The following table shows a breakdown of our costs for feedstock and other materials and the percentage they represent as a proportion of total feedstock and other materials costs for the years indicated.

	Year ended 31 December					
	2014		2015		2016	
	(RM million, except percentages)					
Naphtha	5,790.0	78.6%	4,024.6	74.4%	3,295.5	68.6%
Ethylene[(1)]	1,392.0	18.9%	1,206.9	22.3%	1,332.7	27.7%
Propylene	33.1	0.4%	20.2	0.4%	78.7	1.6%
Other materials[(2)(3)]	153.2	2.1%	156.3	2.9%	98.5	2.1%
Total	**7,368.3**	**100.0%**	**5,408.0**	**100.0%**	**4,805.4**	**100.0%**

Notes:

(1) Includes ethylene that we purchased through the Third Party Ethylene Arrangement.

(2) "Other materials" includes butene, hexene, hydrogen, catalysts and other chemicals, and by-products such as methane and fuel gas for our co-generation plant.

(3) We classify by-products which are used to generate utilities as a credit against "other material" costs. As a result, our costs for other materials are offset by by-product credits. By-product value is primarily determined with reference to our purchase price for feedstock and/or products.

(iv) Other income

Other income consists primarily of:

(a) utilities sales consisting of water and electricity to Lotte Ube;

(b) insurance proceeds from an insurance claim that we made in relation to damage to a gas turbine at our co-generation plant in Pasir Gudang; and

(c) other items, such as land rental income, sales of scrap and income from the rental of a pipeline.

The following table sets out the key components of our other income and the percentage they represent as a proportion of total other income for the years indicated.

	Year ended 31 December					
	2014		2015		2016	
	(RM million, except percentages)					
Utilities sales to Lotte Ube	2.4	14.0%	11.0	40.7%	7.2	53.7%
Insurance proceeds for gas turbine claim	11.3	65.7%	10.5	38.9%	-	-
Others	3.5	20.3%	5.5	20.4%	6.2	46.3%
Total other income	**17.2**	**100.0%**	**27.0**	**100.0%**	**13.4**	**100.0%**

(v) Distribution expenses

Distribution expenses consist primarily of:

(a) domestic and export delivery costs;

(b) royalties that we pay to LCC for the license to manufacture certain product grades that are proprietary to LCC ("**Royalty**");

(c) sales commissions that we pay to trading houses; and

(d) domestic and export insurance costs.

The following table sets out the key components of our distribution expenses and the percentage they represent as a proportion of total distribution expenses for the years indicated.

	Year ended 31 December					
	2014		2015		2016	
	(RM million, except percentages)					
Delivery cost – domestic[1]	40.5	38.6%	40.8	38.1%	39.9	39.1%
Delivery cost - export	56.8	54.2%	57.7	53.8%	53.7	52.5%
Sales commission (including Royalty)	7.0	6.7%	8.2	7.7%	8.3	8.1%
Domestic and export insurance	0.5	0.5%	0.4	0.4%	0.3	0.3%
Total distribution expenses	**104.8**	**100.0%**	**107.1**	**100.0%**	**102.2**	**100.0%**

Note:

(1) Domestic delivery costs are costs for the delivery of our products produced in Indonesia to the Indonesian markets, and our products produced in Malaysia to the Malaysian markets.

(vi) Administrative expenses

Administrative expenses consist primarily:

(a) direct payroll expenses consisting of direct labour costs and retirement benefits which includes contributions to Employees' Provident Fund in Malaysia and defined benefit plans in Indonesia, and including bonuses that we pay to our employees based in part on our profitability;

(b) professional expenses including legal fees, living allowances for expatriate, and fees and expenses that we pay to LCC for secondees under a service level agreement for the provision of management and consulting services;

(c) fringe benefits, which include, among others, welfare expenditures such as performance rewards, pensions and expenses incurred for board of directors' and shareholders' meetings;

(d) depreciation and amortisation of our property, plant and equipment not used in the production process; and

(e) repairs and maintenance of our property, plant and equipment not used in the production process.

The following table sets out the key components of our administrative expenses and the percentage they represent as a proportion of total administrative expenses for the years indicated.

	Year ended 31 December					
	2014		2015		2016	
	(RM million, except percentages)					
Direct labour cost	29.9	40.5%	37.2	42.8%	41.1	46.8%
Retirement cost	3.4	4.6%	4.4	5.1%	5.0	5.7%
Professional expenses	10.8	14.6%	16.9	19.4%	16.1	18.3%
Fringe benefits	8.3	11.2%	6.7	7.7%	6.8	7.7%
Depreciation and amortisation	7.6	10.3%	9.3	10.7%	3.2	3.6%
Repairs and maintenance	0.9	1.2%	0.7	0.8%	1.9	2.2%
Others[1]	12.9	17.6%	11.8	13.5%	13.7	15.7%
Total administrative expenses	**73.8**	**100.0%**	**87.0**	**100.0%**	**87.8**	**100.0%**

Note:

(1) "Others" includes expenses relating to travel, rental, training and leased circuits.

(vii) Foreign exchange differences

Foreign exchange differences consist primarily of:

(a) realised foreign exchange gains or losses, which arise primarily from changes of the RM and the IDR to USD exchange rates, with the RM or the IDR strengthening or weakening, respectively, between the transaction date and the settlement date of the transaction; and

(b) unrealised foreign exchange gains or losses, which arise primarily from changes in the RM and the IDR to USD exchange rates, with the RM or the IDR strengthening or weakening, respectively, between the transaction date and year end.

(viii) Fair value changes on derivatives

Fair value changes on derivatives include:

(a) unrealised gains or losses on the Cross-Currency Swap, which arose as a result of changes in the IDR to USD exchange rate, with a strengthening of the USD resulting in a loss on the Cross-Currency Swap and a weakening of the USD resulting in a gain on the Cross-Currency Swap; and

(b) the equity swap arrangement entered into between our subsidiary, LCT International SB, with Maybank IB in relation to the shares held in PT LCT Tbk ("**Underlying Shares**"), our indirect subsidiary listed on the Indonesia Stock Exchange, to gain economic exposure to the performance of the Underlying Shares ("**Total Return Equity Swap**"). The Total Equity Return Swap is remeasured to fair value at the reporting date. The fair value change on the derivative is recognised in profit or loss.

Under terms of the Total Return Equity Swap, we are able to request for early partial settlements of the swap, which we may carry out from time to time, depending on market conditions. Please refer to Annexure C(2).1(v) of this Prospectus for further details.

(ix) Other expenses

Other expenses consist primarily of:

(a) property, plant and equipment written off as a result of their incompatibility with equipment from our TE3 Project; and

(b) cost of utilities sales to Lotte Ube, which consists of electricity and water supplied from our Pasir Gudang site.

The following table sets out the key components of other expenses and the percentage they represent of total other expenses for the years indicated.

	Year ended 31 December					
	2014		2015		2016	
	(RM million, except percentages)					
Property, plant and equipment written off	13.1	72.4%	11.1	51.1%	49.2	87.5%
Cost of utilities sales to Lotte Ube	2.4	13.3%	10.3	47.5%	6.1	10.9%
Others	2.6	14.3%	0.3	1.4%	0.9	1.6%
Total other expenses	**18.1**	**100.0%**	**21.7**	**100.0%**	**56.2**	**100.0%**

(x) Finance income

Finance income consists of interest from bank deposits.

(xi) Finance costs

Finance costs consists primarily of:

(a) interest expense on our USD term loan, bond, *Sukuk* and short-term borrowings;

(b) bank charges;

(c) charges on letters of credit; and

(d) other finance costs mainly arising from the unwinding of discount in the provision of dismantling costs. We have an obligation to dismantle and remove structures on certain sites and restore those sites at the end of the lease term to an acceptable condition. For these affected sites, the liabilities for dismantling, removal and restoration costs are recognised at the present value of the estimated future expenditure discounted using an appropriate discount rate. The unwinding of the discount in the provision is included as a finance cost.

(xii) Share of results of associates

Our share of results of associates reflects our share of profit or loss, net of tax, of our associates.

As at the LPD, we have two associates, Lotte Ube in which we hold a 10% stake, and LC USA in which we hold a 40% stake.

(xiii) Income tax

Tax expenses include current tax expense and deferred tax expense. We calculate current income tax at the statutory tax rate of the estimated assessable profit for the year in the prevailing jurisdiction. In the years ended 31 December 2014, 2015 and 2016, we calculated Malaysian current income tax at the statutory tax rate of 25%, 25% and 24%, respectively.

Our deferred tax balances primarily relate to our unused tax incentives and unclaimed capital allowances on qualifying capital expenditure in respect of our Malaysian operations, which are denominated in RM. However, as our functional currency is the USD, we convert these RM-denominated balances to our functional currency, which is USD, and recognise any gain or loss in the value of the tax incentives as deferred tax income or expenses.

12.2.5 Review of past performance

Year ended 31 December 2014 compared to year ended 31 December 2015

The following table presents selected data from our statement of comprehensive income, the percentage such amounts represent of total revenue and their percentage change for the years indicated.

	Year ended 31 December				
	2014		2015		
	(RM million)	% of revenue	(RM million)	% of revenue	% change
Revenue	8,611.2	100.0%	8,147.8	100.0%	(5.4%)
Cost of goods sold	(8,375.1)	(97.3%)	(6,828.7)	(83.8%)	(18.5%)
Gross profit	236.1	2.7%	1,319.1	16.2%	458.7%
Other income	17.2	0.2%	27.0	0.3%	57.0%
Distribution expenses	(104.8)	(1.1%)	(107.1)	(1.2%)	2.2%
Administrative expenses	(73.8)	(0.9%)	(87.0)	(1.1%)	17.9%
Foreign exchange differences	(1.2)	(0.0%)	(84.7)	(1.0%)	6,958.3%
Fair value changes on derivatives	2.4	0.0%	28.1	0.3%	1,070.8%
Other expenses	(18.1)	(0.2%)	(21.7)	(0.3%)	19.9%
Profit from operations	57.8	0.7%	1,073.7	13.2%	1,757.6%
Finance income	1.8	0.0%	3.8	0.0%	111.1%
Finance costs	(41.1)	(0.5%)	(22.8)	(0.2%)	(44.5%)
Net finance costs	(39.3)	(0.5%)	(19.0)	(0.2%)	(51.7%)
Share of results of associates	(0.7)	(0.0%)	(4.5)	(0.1%)	542.9%
Profit before tax	17.8	0.2%	1,050.2	12.9%	5,800.0%
Income tax	(38.0)	(0.4%)	(436.1)	(5.4%)	1,047.6%
Net (loss)/profit for the year	**(20.2)**	**(0.2%)**	**614.1**	**7.5%**	**3,140.1%**

(i) Revenue

Revenue decreased by 5.4% from RM8,611.2 million in the year ended 31 December 2014 to RM8,147.8 million in the year ended 31 December 2015.

The decrease in our revenue was primarily a result of the following:

(i) decrease in the average sales prices of our products, as follows:

	2014	2015	% change	2014	2015	% change
	Average sales price (USD per MT)			Average sales price (RM per MT)		
Polyolefins	1,640	1,286	(21.6%)	5,348	4,951	(7.4%)
Olefins and derivatives products	968	637	(34.2%)	3,156	2,452	(22.3%)

The decrease in the average sales prices of our products was mainly due to the decline in our feedstock prices which reflected the decline in average crude oil prices as we generally pass changes in feedstock prices directly to our customers. However, the decrease in our average sales prices in RM term was lower than in USD term mainly due to the weakening of RM against USD from USD1:RM3.3 in 2014 to USD1:RM3.8 in 2015 when we translate our results from functional currency of USD to reporting currency of RM.

The decrease in our sales prices was also in line with the declining trend in the international prices which, as stated in the IMR Report, declined during the years under review from an average price of USD1,534 per MT to USD1,205 per MT for polyolefin and USD1,286 per MT to USD869 per MT for olefins and derivatives (butadiene and benzene only) products.

In addition, the decrease in the average sales prices of our products were not in the same quantum and same timing as the reduction in the feedstock price because changes in sales price would also depend on other factors such as market conditions and customer demand. Please refer to Section 12.2.2(iv) of this Prospectus for further details; and

(ii) partially offsetting the decrease in the average sales prices of our products was a 7.4% increase in our sales volumes from 1,847.6 KT in the year ended 31 December 2014 to 1,984.8 KT in the year ended 31 December 2015. Sales volumes increased for all of our products apart from polyethylene, largely as a result of more stable operations in 2015 than in 2014 as our plants experienced a period of unplanned shutdown due to power outage in 2014. For a description of the unplanned shutdown of our plants in 2014, please refer to Section 7.12 of this Prospectus.

Polyolefin products

(a) Polypropylene and Polyethylene Malaysia

As a result of an increase in sales volumes due to our stable operations leading to higher quantities of polypropylene and polyethylene produced offset by decline in average sales prices of both products, our revenue from sales of these products were slightly higher in the year ended 31 December 2015 than in the year ended 31 December 2014, as indicated in the table below:

	2014	2015	% change from 2014 to 2015	2014	2015	% change from 2014 to 2015	2014	2015	% change from 2014 to 2015
	Average sales price (RM per MT)			Sales volume (KT)			Revenue (RM million)		
Polypropylene	5,394	4,754	(11.9%)	361.1	410.5	13.7%	1,947.7	1,951.6	0.2%
Polyethylene Malaysia	5,325	4,995	(6.2%)	546.2	582.3	6.6%	2,908.3	2,908.7	0.0%

(b) Polyethylene Indonesia

Revenue from polyethylene produced by our plants in Indonesia decreased by 14.9% from RM1,927.6 million in the year ended 31 December 2014 to RM1,639.8 million in the year ended 31 December 2015. This was primarily a result of a decrease in sales volumes by 11.4% from 361.2 KT in the year ended 31 December 2014 to 320.0 KT in the year ended 31 December 2015, mainly due to constraints in the supply of ethylene in Indonesia. Contributing to the decrease in revenue was a decline in average sales prices from RM5,337 per MT in the year ended 31 December 2014 to RM5,124 per MT in the year ended 31 December 2015.

Olefins and derivative products

(c) Ethylene

Revenue from ethylene sales increased by 154.4% from RM80.5 million in the year ended 31 December 2014 to RM204.8 million in the year ended 31 December 2015. This was primarily a result of an increase in sales volumes by 159.6% from 18.8 KT in the year ended 31 December 2014 to 48.8 KT in the year ended 31 December 2015, mainly due to increased ethylene sales to our Indonesian polyethylene plant in 2015 under the Third Party Ethylene Arrangement. Partially offsetting the higher sales volumes was a 2.0% decrease in average sales prices from RM4,282 per MT in the year ended 31 December 2014 to RM4,197 per MT in the year ended 31 December 2015.

(d) Propylene

Revenue from propylene sales decreased from RM6.6 million in the year ended 31 December 2014 to zero in the year ended 31 December 2015. In the year ended 31 December 2014 we sold a small portion of our propylene production to external parties for optimal inventory control during the turnaround of our PP2 Plant but we used our entire production of propylene as feedstock for our internal operations in 2015.

(e) Benzene, Toluene, Butadiene, TBA and by-products

As a result of a decrease in average sales price and offset by an increase in sales volume of benzene, toluene, butadiene, TBA and by-products, our revenue from sales of benzene, toluene, butadiene, TBA and by-products were lower in the year ended 31 December 2015 than in the year ended 31 December 2014, as indicated in the table below:

	2014	2015	% change from 2014 to 2015	2014	2015	% change from 2014 to 2015	2014	2015	% change from 2014 to 2015
	Average sales price (RM per MT)			Sales volume (KT)			Revenue (RM million)		
Benzene	3,942	2,621	(33.5%)	75.3	86.5	14.9%	296.8	226.7	(23.6%)
Toluene	3,583	2,696	(24.8%)	40.5	49.0	21.0%	145.1	132.1	(9.0%)
Butadiene	4,134	3,486	(15.7%)	74.9	84.5	12.8%	309.6	294.6	(4.8%)
TBA	2,529	2,053	(18.8%)	68.4	83.2	21.6%	173.0	170.8	(1.3%)
By-products	2,724	1,933	(29.0%)	299.6	320.0	6.8%	816.0	618.7	(24.2%)

(ii) Cost of goods sold

Cost of goods sold decreased by 18.5% from RM8,375.1 million in the year ended 31 December 2014 to RM6,828.7 million in the year ended 31 December 2015, primarily due to the decline in feedstock prices resulting from the decrease in the price of crude oil.

(a) Feedstock and other materials

Cost of feedstock and other materials decreased by 26.6% from RM7,368.3 million in the year ended 31 December 2014 to RM5,408.0 million in the year ended 31 December 2015. This decrease was driven largely by a decrease in the prices of feedstock and other materials resulting mainly from a decrease in the price of naphtha and, to a lesser extent, a decrease in the price of ethylene.

Our costs for naphtha decreased by 30.5% from RM5,790.0 million in the year ended 31 December 2014 to RM4,024.6 million in the year ended 31 December 2015. This was primarily as a result of a 44.2% decrease in average naphtha prices in USD terms, from USD929 per MT in the year ended 31 December 2014 to USD518 per MT in the year ended 31 December 2015. Average naphtha prices decreased primarily as a result of the decrease in the price of crude oil. The volume of naphtha we consumed increased by 6.2% from 1,910.3 KT in the year ended 31 December 2014 to 2,028.6 KT in the year ended 31 December 2015, primarily as a result of higher production in 2015 attributable to stable plant operations.

Our costs for ethylene decreased by 13.3% from RM1,392.0 million in the year ended 31 December 2014 to RM1,206.9 million in the year ended 31 December 2015. Our costs for ethylene were lower primarily as a result of a 23.9% decrease in average ethylene prices in USD terms, from USD1,425 per MT in the year ended 31 December 2014 to USD1,084 per MT in the year ended 31 December 2015. Average ethylene prices decreased primarily as a result of the decrease in the price of crude oil. Our consumption volume of externally-purchased ethylene decreased by 4.1% from 299.7 KT in the year ended 31 December 2014 to 287.4 KT in the year ended 31 December 2015, primarily as a result of lower production levels of our Indonesian plant as we were not able to source for ethylene supply from third parties at an economical price.

(b) Utilities and supplies

Costs of utilities and supplies increased by 13.9% from RM522.9 million in the year ended 31 December 2014 to RM595.7 million in the year ended 31 December 2015. This increase was primarily due to an increase in natural gas prices and our consumption of fuel gas, which we use to produce steam. We consumed more fuel gas in 2015 than 2014 primarily due to our increased production levels in 2015 on account of more stable operations. In addition, we also entered into a maintenance contract for our gas turbines in 2015, amounting to about RM15.0 million.

(c) Fixed manufacturing costs

Fixed manufacturing costs increased by 27.2% from RM212.2 million in the year ended 31 December 2014 to RM269.9 million in the year ended 31 December 2015. This increase was primarily due to more routine maintenance works carried out to ensure stable plant operations, and an increase in payroll costs resulting from an annual performance bonus given to employees in 2015.

(d) Depreciation and amortisation

Depreciation and amortisation increased by 23.7% from RM312.9 million in the year ended 31 December 2014 to RM387.2 million in the year ended 31 December 2015. This increase was primarily due to turnaround and catalyst costs capitalised towards the end of 2014, and the capitalisation of spare parts into assets in 2015.

(e) Net changes in inventory

Net changes in inventory changed from a net increase of RM41.2 million in the year ended 31 December 2014 to a net decrease of RM167.9 million in the year ended 31 December 2015. This change was primarily due to the decrease in crude oil prices and correspondingly, prices of our products, which resulted in a decrease in the value of our finished goods.

(iii) Gross profit and gross profit margin

As a result of the foregoing, gross profit increased by 458.7% from RM236.1 million in the year ended 31 December 2014 to RM1,319.1 million in the year ended 31 December 2015. Gross profit margin increased from 2.7% in the year ended 31 December 2014 to 16.2% in the year ended 31 December 2015.

The improvement in our gross profit margin was due to the following:

(a) decrease in the average sales price of our products which was at a lower amount than the decrease in our feedstock prices; and

(b) higher sales volume following more stable operations in 2015.

(iv) Other income

Other income increased by 57.0% from RM17.2 million in the year ended 31 December 2014 to RM27.0 million in the year ended 31 December 2015, primarily due to a 358.3% increase in utilities sales to Lotte Ube from RM2.4 million in the year ended 31 December 2014 to RM11.0 million in the year ended 31 December 2015, as we only started supplying utilities to Lotte Ube in June 2014 and had the first full year of utilities sales in 2015.

(v) Distribution expenses

Distribution expenses remained relatively steady from the year ended 31 December 2014 to the year ended 31 December 2015, increasing by 2.2% from RM104.8 million in the year ended 31 December 2014 to RM107.1 million in the year ended 31 December 2015.

(vi) Administrative expenses

Administrative expenses increased by 17.9% from RM73.8 million in the year ended 31 December 2014 to RM87.0 million in the year ended 31 December 2015, primarily due to an increase in direct payroll expenses and an increase in professional expenses.

Direct payroll expenses increased by 24.9% from RM33.3 million in the year ended 31 December 2014 to RM41.6 million in the year ended 31 December 2015, primarily due to higher bonuses paid in 2015. We did not pay significant bonuses in 2014 because we were loss-making that year.

Professional fees increased by 56.5% from RM10.8 million in the year ended 31 December 2014 to RM16.9 million in the year ended 31 December 2015, primarily due to increased expenses under our service level agreement with LCC. Amounts that were due under the service level agreement in 2014 were only billed to us in 2015. As a result, we closed our accounts for the year ended 31 December 2014 based on a best estimate of our service level agreement fee. The under accrual of RM2.9 million is the difference between the estimated service level agreement fee of RM3.6 million and the bill that we received in 2015 of RM6.5 million. This was a one-off arrangement and we were subsequently billed in the same year as the expense was incurred.

(vii) Foreign exchange differences

Foreign exchange differences increased significantly from a loss of RM1.2 million in the year ended 31 December 2014 to a loss of RM84.7 million in the year ended 31 December 2015. This was primarily due to the depreciation of the RM against the USD in 2015, from USD1:RM3.5 as at 31 December 2014 to USD1:RM4.3 as at 31 December 2015.

Our realised foreign exchange losses in 2015 was a result of losses of RM31.8 million from the settlement of our Cross-Currency Swap and losses on our account receivables in 2015 due to a continued depreciation of the RM against the USD throughout 2015, as compared to 2014.

(viii) Fair value changes on derivatives

Fair value changes on derivatives increased significantly from a gain of RM2.4 million in the year ended 31 December 2014 to a gain of RM28.1 million in the year ended 31 December 2015 primarily due to a RM28.8 million reversal of unrealised losses on the Cross-Currency Swap in 2015. The unrealised loss was reversed upon settlement of the Cross-Currency Swap in June 2015, at which time we registered a realised foreign exchange loss of RM31.8 million. We present the RM28.8 million reversal of prior unrealised losses in the line item "fair value changes on derivatives" and the corresponding realised foreign exchange loss of RM31.8 million in the line item "foreign exchange differences". A net loss of RM3.0 million has been recognised in profit or loss.

(ix) Other expenses

Other expenses increased by 19.9% from RM18.1 million in the year ended 31 December 2014 to RM21.7 million in the year ended 31 December 2015, primarily due to higher cost of utilities sales to Lotte Ube in 2015.

(x) Profit from operations

As a result of the foregoing, profit from operations increased significantly from RM57.8 million in the year ended 31 December 2014 to RM1,073.7 million in the year ended 31 December 2015. Profit from operations margin increased from 0.7% in the year ended 31 December 2014 to 13.2% in the year ended 31 December 2015.

(xi) Finance income

Finance income increased by 111.1% from RM1.8 million in the year ended 31 December 2014 to RM3.8 million in the year ended 31 December 2015, primarily due to higher interest income from increased bank deposits.

(xii) Finance costs

Finance costs decreased by 44.5% from RM41.1 million in the year ended 31 December 2014 to RM22.8 million in the year ended 31 December 2015, primarily because of the repayment of our USD term loan, bond and *Sukuk* in 2015.

(xiii) Share of results of associates

Share of losses of associates increased from RM0.7 million in the year ended 31 December 2014 to RM4.5 million in the year ended 31 December 2015, primarily due to increased losses by Lotte Ube. The losses were higher in 2015 than in 2014 primarily because it commenced commercial operations in August 2015. Its losses were primarily due to operating at low utilisation rates and selling its products at low prices in order to expand its customer base and grow its business.

(xiv) Profit before tax

Due to the foregoing, profit before tax increased significantly from RM17.8 million in the year ended 31 December 2014 to RM1,050.2 million in the year ended 31 December 2015. Profit before tax margin increased from 0.2% in the year ended 31 December 2014 to 12.9% in the year ended 31 December 2015.

(xv) Income tax

Income tax expense increased from RM38.0 million in the year ended 31 December 2014 to RM436.1 million in the year ended 31 December 2015, primarily due to a substantial decrease in our deferred tax assets as a result of the depreciation of the RM against the USD. The decrease in our deferred tax assets arose mainly from the translation of the tax bases of qualifying assets, unused tax losses and other allowances denominated in RM to the functional currency of USD. The higher income tax expense was also due to a substantial increase in our profit before tax.

(xvi) Net profit for the year

As a result of the foregoing, net profit for the year increased from a net loss of RM20.2 million in the year ended 31 December 2014 to a net profit of RM614.1 million in the year ended 31 December 2015.

Year ended 31 December 2015 compared to year ended 31 December 2016

The following table presents selected data from our statement of comprehensive income, the percentage such amounts represent of total revenue and their percentage change for the years indicated.

	Year ended 31 December				
	2015		2016		
	(RM million)	% of revenue	(RM million)	% of revenue	% change
Revenue	8,147.8	100.0%	8,136.6	100.0%	(0.1%)
Cost of goods sold	(6,828.7)	(83.8%)	(6,154.7)	(75.6%)	(9.9%)
Gross profit	1,319.1	16.2%	1,981.9	24.4%	50.2%
Other income	27.0	0.3%	13.4	0.2%	(50.4%)
Distribution expenses	(107.1)	(1.2%)	(102.2)	(1.2%)	(4.6%)
Administrative expenses	(87.0)	(1.1%)	(87.8)	(1.1%)	0.9%
Foreign exchange differences	(84.7)	(1.0%)	(21.1)	(0.3%)	(75.1%)
Fair value changes on derivatives	28.1	0.3%	(5.4)	(0.1%)	(119.2%)
Other expenses	(21.7)	(0.3%)	(56.2)	(0.7%)	159.0%
Profit from operations	1,073.7	13.2%	1,722.6	21.2%	60.4%
Finance income	3.8	0.0%	7.9	0.1%	107.9%
Finance costs	(22.8)	(0.2%)	(15.0)	(0.2%)	(34.2%)
Net finance costs	(19.0)	(0.2%)	(7.1)	(0.1%)	(62.6%)
Share of results of associates	(4.5)	(0.1%)	(5.3)	(0.1%)	17.8%
Profit before tax	1,050.2	12.9%	1,710.2	21.0%	62.8%
Income tax	(436.1)	(5.4%)	(394.1)	(4.8%)	(9.6%)
Net profit for the year	**614.1**	**7.5%**	**1,316.1**	**16.2%**	**114.3%**

(i) Revenue

Revenue decreased by 0.1% from RM8,147.8 million in the year ended 31 December 2015 to RM8,136.6 million in the year ended 31 December 2016.

The decrease in our revenue was primarily a result of the following:

(a) decrease in the average sales prices of our products, as follows:

	2015	2016	% change	2015	2016	% change
	Average sales price (USD per MT)			Average sales price (RM per MT)		
Polyolefins	1,286	1,181	(8.2%)	4,951	4,880	(1.4)%
Olefins and derivatives products	637	602	(5.5%)	2,452	2,490	1.5%

The decrease in the average sales prices of our products was mainly due to the decline in feedstock prices which reflected the decline in average crude oil price as we generally pass changes in feedstock prices directly to our customers. However, the decrease in our average sales prices in RM term was lower than in USD term because of the weakening of RM against USD from USD1:RM3.8 in 2015 to USD1:RM4.1 in 2016 when we translate our results from functional currency of USD to reporting currency of RM. There was an increase in the average sales prices for olefins and derivatives products in RM term in 2016 mainly due to the increase in the sales price of butadiene from RM3,486 per MT to RM4,398 per MT and the weakening of RM against USD from USD1:RM3.8 in 2015 to USD1:RM4.1 in 2016 when we translate our results from functional currency of USD to reporting currency of RM.

The average sales prices of our products was also in line with the trend in the international prices which, as stated in the IMR Report, declined from an average price of USD1,205 per MT to USD1,116 per MT for polyolefin and increased from USD869 per MT to USD885 per MT for olefins and derivatives (butadiene and benzene only) products.

In addition, the decrease in the average sales prices of our products were not in the same quantum and same timing as the reduction in the feedstock price because changes in sales price would also depend on other factors such as market conditions and customer demand. Please refer to Section 12.2.2(iv) of this Prospectus for further details; and

(b) Sales volumes remained steady, increasing by 0.4% from 1,984.8 KT in the year ended 31 December 2015 to 1,993.4 KT in the year ended 31 December 2016.

Polyolefins

(a) Polypropylene and Polyethylene Malaysia

As a result of a decrease in sales volume and average sales prices, our revenue from sales of polypropylene and polyethylene Malaysia were lower in the year ended 31 December 2016 than in the year ended 31 December 2015, as indicated below:

	2015	2016	% change from 2015 to 2016	2015	2016	% change from 2015 to 2016	2015	2016	% change from 2015 to 2016
	Average sales price (RM per MT)			Sales volume (KT)			Revenue (RM million)		
Polypropylene	4,754	4,573	(3.8%)	410.5	410.3	(0.1%)	1,951.6	1,876.4	(3.9%)
Polyethylene Malaysia	4,995	4,981	(0.3%)	582.3	570.2	(2.1%)	2,908.7	2,840.4	(2.3%)

The marginally lower production volumes of polypropylene were because of the temporary shutdown of our PP1 Plant and PP2 Plant for debottlenecking works to increase their nameplate capacities. We expect our production of polypropylene to increase in 2017 as a result of the debottlenecking works. For Polyethylene Malaysia, the decrease in the sales volumes was mainly due to shutdown of the PE3 Plant for turnaround and the inspection by MDOSH for the PE2 Plant.

(b) Polyethylene Indonesia

Revenue from polyethylene produced by our plants in Indonesia increased by 7.5% from RM1,639.8 million in the year ended 31 December 2015 to RM1,762.5 million in the year ended 31 December 2016. This was primarily a result of an increase in sales volumes by 8.5% from 320.0 KT in the year ended 31 December 2015 to 347.3 KT in the year ended 31 December 2016, mainly due to an increase in the supply of ethylene for the plant which allowed us to run the plant at a higher utilisation rate of 76% in the year ended 31 December 2016 compared to 71% in the year ended 31 December 2015. Supply constraints of ethylene in Indonesia, volatility in prices and several turnaround activities resulted in us producing lower production volumes for polyethylene in Indonesia in the year ended 31 December 2015. Partially offsetting the increase in revenue from higher sales volumes was a 1.0% decrease in average sales prices from RM5,124 per MT in the year ended 31 December 2015 to RM5,075 per MT in the year ended 31 December 2016, primarily due to the decline in feedstock prices.

Olefins and derivative products

(c) Ethylene and Benzene

As a result of an increase in sales volume, our revenue from sales of ethylene and benzene were higher in the year ended 31 December 2016 than in the year ended 31 December 2015. Partially offsetting the increase in revenue from higher sales volumes was a 1.0% decrease in average sales prices, as indicated in the table below.

	2015	2016	% change from 2015 to 2016	2015	2016	% change from 2015 to 2016	2015	2016	% change from 2015 to 2016
	Average sales price (RM per KT)			Sales volume (KT)			Revenue (RM million)		
Ethylene	4,197	4,157	(1.0%)	48.8	63.0	29.1%	204.8	261.9	27.9%
Benzene	2,621	2,596	(1.0%)	86.5	94.4	9.1%	226.7	245.1	8.1%

This increase in our ethylene sales volumes was primarily related to our ethylene sales through the Third Party Ethylene Arrangement. We were able to supply more ethylene to our Indonesian plants through the Third Party Ethylene Arrangement primarily because of the lower production volumes (and, consequently, lower ethylene requirements) at our polyethylene plants in Malaysia due to the shutdown of the PE3 Plant for turnaround and an inspection by MDOSH of the PE2 Plant.

The increase in our benzene sales volumes was mainly due to an increase in production volumes as a result of a modification to the pygas feed pump in the BTX Plant in October 2015, which resulted in more stable plant operations.

The decrease in average sales prices of ethylene and benzene was primarily due to the decline in feedstock prices.

(d) Propylene

There was no revenue from propylene sales in the year ended 31 December 2016 because we used our entire production of propylene as feedstock for the production of our polypropylene products.

(e) Butadiene

Revenue from butadiene sales increased by 30.0% from RM294.6 million in the year ended 31 December 2015 to RM383.1 million in the year ended 31 December 2016, primarily a result of an increase in average sales price, and to a lesser extent an increase in sales volumes. Average sales prices increased by 26.2% from RM3,486 per MT in the year ended 31 December 2015 to RM4,398 per MT in the year ended 31 December 2016, and our sales volume increased by 3.1% from 84.5 KT in the year ended 31 December 2015 to 87.1 KT in the year ended 31 December 2016, primarily due to increased demand in China and India for synthetic rubber, a product made from butadiene.

(f) Toluene, TBA and by-products

As a result of a decrease in sales volume and average sales prices, our revenue from sales of toluene, TBA and by-products were lower in the year ended 31 December 2016 than in the year ended 31 December 2015, as indicated in the table below:

	2015	2016	% change from 2015 to 2016	2015	2016	% change from 2015 to 2016	2015	2016	% change from 2014 to 2015
	Average sales price (RM per MT)			Sales volume (KT)			Revenue (RM million)		
Toluene	2,696	2,561	(5.0%)	49.0	42.1	(14.1%)	132.1	107.8	(18.4%)
TBA	2,053	1,904	(7.3%)	83.2	81.3	(2.3%)	170.8	154.8	(9.4%)
By-products	1,933	1,695	(12.3%)	320.0	297.7	(7.0%)	618.7	504.6	(18.4%)

The decrease in sales volume was due to the following:

(i) For toluene, the composition of naphtha that we purchased in 2016 produced pygas, as a by-product, that was less suited for the production of toluene than the naphtha that we purchased in 2015. As a result, production volumes of toluene decreased, leading to a decrease in toluene sales.

(ii) For TBA, it was due to decreased production volumes as a result of the differing compositions of naphtha across the two years, which affects the composition of mixed C4 produced during the cracking process, resulting in decreased production volumes of TBA in that year.

(iii) For by-products, this was mainly due to the one-off sale of naphtha in 2015.

(ii) Cost of goods sold

Cost of goods sold decreased by 9.9% from RM6,828.7 million in the year ended 31 December 2015 to RM6,154.7 million in the year ended 31 December 2016, primarily due to the decline in feedstock prices resulting from the decrease in the price of crude oil.

(a) Feedstock and other materials

Cost of feedstock and other materials decreased by 11.1% from RM5,408.0 million in the year ended 31 December 2015 to RM4,805.4 million in the year ended 31 December 2016. This decrease was driven largely by a decrease in the prices of naphtha and other materials, which were partially offset by an increase in purchase volumes of ethylene and, to a lesser extent, purchase volumes of propylene.

Our costs for naphtha decreased by 18.1% from RM4,024.6 million in the year ended 31 December 2015 to RM3,295.5 million in the year ended 31 December 2016. The lower naphtha costs were primarily a result of a 23.9% decrease in average naphtha prices in USD terms, from USD518 (equivalent to RM1,870) per MT in the year ended 31 December 2015 to USD394 (equivalent to RM1,583) per MT in the year ended 31 December 2016. Average naphtha prices decreased primarily as a result of the decrease in the price of crude oil. The volume of naphtha we consumed remained relatively steady, decreasing from 2,028.6 KT in the year ended 31 December 2015 to 2,020.7 KT in the year ended 31 December 2016.

Our costs for ethylene increased by 10.4% from RM1,206.9 million in the year ended 31 December 2015 to RM1,332.7 million in the year ended 31 December 2016. Our costs for ethylene were higher primarily as a result of a 9.9% increase in our purchase volume of ethylene from 288.0 KT in the year ended 31 December 2015 to 316.5 KT in the year ended 31 December 2016. We purchased more ethylene in 2016 than 2015 primarily to maximise the production of our Indonesian plants to benefit from the higher margins for our ethylene-derived products at the time.

Contributing to our increased ethylene costs was the weakening of the RM against the USD. Whereas the average price of ethylene decreased by 4.3% in USD terms from USD1,084 per MT in the year ended 31 December 2015 to USD1,037 per MT in the year ended 31 December 2016, the average price of ethylene increased by 2.1% when converted to RM terms for purposes of preparing our financial statements.

Our costs for propylene increased by 289.6% from RM20.2 million in the year ended 31 December 2015 to RM78.7 million in the year ended 31 December 2016. Our costs for propylene were higher primarily as a result of a 295.5% increase in the volume of propylene we purchased, from 6.7 KT in the year ended 31 December 2015 to 26.5 KT in the year ended 31 December 2016. We purchased more propylene in 2016 than 2015 primarily due to increased capacity and utilisation of our polypropylene plants following completion of debottlenecking works in 2016.

(b) Utilities and supplies

Cost of utilities and supplies increased by 9.6% from RM595.7 million in the year ended 31 December 2015 to RM652.7 million in the year ended 31 December 2016. The increase was primarily due to the increase in natural gas prices.

(c) Fixed manufacturing costs

Fixed manufacturing costs increased by 8.3% from RM269.9 million in the year ended 31 December 2015 to RM292.4 million in the year ended 31 December 2016. The increase was primarily due to an increase in payroll costs resulting from a higher annual performance bonus given to employees in 2016.

(d) Depreciation and amortisation

Depreciation and amortisation decreased by 4.7% from RM387.2 million in the year ended 31 December 2015 to RM369.1 million in the year ended 31 December 2016. This decrease was primarily due to write-offs in the year ended 31 December 2016 of a C3 refrigerant compressor, a C2 refrigerant compressor and a turbine rotor, which were yet to be fully depreciated. These equipment were written off as they were not compatible with our TE3 Project.

(e) Net changes in inventories

Net changes in inventories decreased by 79.1% from RM167.9 million in the year ended 31 December 2015 to RM35.1 million in the year ended 31 December 2016. This decrease was primarily because the impact of the decrease in feedstock costs was higher in 2015 as compared to 2016 due to higher levels of decrease in crude oil prices from 2014 to 2015 than from 2015 to 2016.

(iii) Gross profit and gross profit margin

As a result of the foregoing, our gross profit increased by 50.2% from RM1,319.1 million in the year ended 31 December 2015 to RM1,981.9 million in the year ended 31 December 2016. Gross profit margin increased from 16.2% in the year ended 31 December 2015 to 24.4% in the year ended 31 December 2016.

The improvement in our gross profit margin was due to the following:

(a) decrease in the average sales price of our products which was at a lower amount than the decrease in our feedstock prices; and

(b) decrease in our cost of goods sold mainly due to the decline in the cost of feedstock and other materials.

(iv) Other income

Other income decreased by 50.4% from RM27.0 million in the year ended 31 December 2015 to RM13.4 million in the year ended 31 December 2016, primarily due to the following:

(a) as we had insurance proceeds in the year ended 31 December 2015 due to the final insurance proceeds for the gas turbine claim, which was a non-recurring insurance payment; and

(b) a 34.5% decrease in utilities sales to Lotte Ube from RM11.0 million in the year ended 31 December 2015 to RM7.2 million in the year ended 31 December 2016, primarily due to lower production volume of Lotte Ube in 2016.

(v) Distribution expenses

Distribution expenses decreased by 4.6% from RM107.1 million in the year ended 31 December 2015 to RM102.2 million in the year ended 31 December 2016. This was primarily due to a decrease in delivery costs of exports by 6.9% from RM57.7 million in the year ended 31 December 2015 to RM53.7 million in the year ended 31 December 2016, primarily as a result of a decrease in our polyolefin export sales volumes.

(vi) Administrative expenses

Administrative expenses increased by 0.9% from RM87.0 million in the year ended 31 December 2015 to RM87.8 million in the year ended 31 December 2016, primarily due to an increase in direct payroll expenses by 10.8% from RM41.6 million in the year ended 31 December 2015 to RM46.1 million in the year ended 31 December 2016. The increase in direct payroll expenses was primarily due to payment of higher bonuses in 2016 than in 2015 as we were more profitable in 2016 than in 2015, and also as a result of an increase in basic payroll arising from yearly salary increments.

Largely offsetting the increases in administrative expenses was a 65.6% decrease in depreciation and amortisation expenses from RM9.3 million in the year ended 31 December 2015 to RM3.2 million in the year ended 31 December 2016, primarily due to the software that we purchased in 2013 that was fully depreciated in 2015.

(vii) Foreign exchange differences

Foreign exchange differences decreased by 75.1% from a loss of RM84.7 million in the year ended 31 December 2015 to a loss of RM21.1 million in the year ended 31 December 2016, primarily due to a decrease in our realised foreign exchange losses. Our realised foreign exchange losses decreased in 2016 due to continued depreciation of the RM throughout 2015, compounded with a one-off loss in 2015 of RM31.8 million incurred from the settlement of our Cross Currency Swap in 2015. In 2016, we had a net realised gain in foreign exchange of RM5.4 million as foreign exchange gains during the first eight months of 2016 offset losses recorded in the last four months.

(viii) Fair value changes on derivatives

Fair value changes on derivatives reversed from a gain of RM28.1 million in the year ended 31 December 2015 to a loss of RM5.4 million in the year ended 31 December 2016. This was primarily because we had a RM28.8 million reversal of the unrealised losses on Cross-Currency Swap in 2015 upon settlement of the Cross-Currency Swap. As the Cross-Currency Swap was settled in 2015, we did not have any reversal of unrealised losses in 2016.

Contributing to the loss recorded in the year ended 31 December 2016 was a RM7.1 million fair value decrease on the Total Return Equity Swap as a result of a drop in share prices of the Underlying Shares in 2016.

(ix) Other expenses

Other expenses increased by 159.0% from RM21.7 million in the year ended 31 December 2015 to RM56.2 million in the year ended 31 December 2016, primarily because certain equipment were written off due to their non-compatibility with our TE3 Project.

The value of plant and equipment written off increased by 343.2% from RM11.1 million in the year ended 31 December 2015 to RM49.2 million in the year ended 31 December 2016, primarily as a result of a refurbishment of our NC2 Plant in 2016 as part of our preparation to connect our NC2 Plant with the TE3 Project. In connection with this, we replaced refrigerant compressors and a rotor at our NC2 Plant that have not been fully depreciated, which resulted in us writing off the replaced equipment at an aggregate amount of RM33.0 million. These equipment were replaced as they were deemed unsuitable for current manufacturing processes following a technical evaluation, and will not be used for future production due to different operating conditions.

(x) Profit from operations

As a result of the foregoing, profit from operations increased by 60.4% from RM1,073.7 million in the year ended 31 December 2015 to RM1,722.6 million in the year ended 31 December 2016. Profit from operations margin increased from 13.2% in the year ended 31 December 2015 to 21.2% in the year ended 31 December 2016.

(xi) Finance income

Finance income increased by 107.9% from RM3.8 million in the year ended 31 December 2015 to RM7.9 million in the year ended 31 December 2016, primarily due to higher interest income from increased bank deposits.

(xii) Finance cost

Finance cost decreased by 34.2% from RM22.8 million in the year ended 31 December 2015 to RM15.0 million in the year ended 31 December 2016, primarily because we fully repaid our bond and *Sukuk* upon maturity in 2015.

(xiii) Share of results of associates

Our share of losses in our associates increased by 17.8% from RM4.5 million in the year ended 31 December 2015 to RM5.3 million in the year ended 31 December 2016. Lotte Ube is a relatively new business and only commenced commercial operations in August 2015. Its losses were primarily due to operating at low utilisation rates and selling its products at low prices in order to expand its customer base and grow its business. Lotte Ube's losses increased from 2015 to 2016 primarily due to production costs increasing more than the increase in average selling price.

(xiv) Profit before tax

Due to the foregoing, profit before tax increased by 62.8% from RM1,050.2 million in the year ended 31 December 2015 to RM1,710.2 million in the year ended 31 December 2016. Profit before tax margin increased from 12.9% in the year ended 31 December 2015 to 21.0% in the year ended 31 December 2016.

(xv) Income tax

Income tax expenses decreased by 9.6% from RM436.1 million in the year ended 31 December 2015 to RM394.1 million in the year ended 31 December 2016, due primarily to deferred tax adjustments in the year ended 31 December 2015 which arose from translation of tax bases of qualifying assets, unused tax losses and other allowances to the functional currency, which in turn was due to the significant depreciation in the RM against the USD in 2015.

(xvi) Net profit for the year

As a result of the foregoing, net profit increased by 114.3% from RM614.1 million in the year ended 31 December 2015 to RM1,316.1 million in the year ended 31 December 2016.

12.2.6 Liquidity and capital resources

(i) Working capital

Our principal sources of liquidity are our cash and bank balances, cash generated from our operations and borrowings from financial institutions. Following the Listing, we expect to use the same principal sources of liquidity. Many factors, including our results of operations and financial position and the conditions in the Malaysian and international financial markets, could affect our ability to rely on these sources of funds.

As at 31 December 2016, we had cash and bank balances of RM1,040.3 million and multi-currency trade facilities comprising bankers' acceptances, letters of credit, revolving credit facilities and overdraft facilities with a combined limit of RM2,965.5 million, of which RM629.7 million was drawn and RM2,335.8 million was undrawn.

As at 31 December 2016, our working capital, calculated as current assets minus current liabilities, was a net current asset of RM2,696.0 million.

Based on the above and taking into consideration our funding requirements for our committed capital expenditure and contractual obligations, expected cash flows from operations, cash and bank balances, bank borrowings and facilities, together with the estimated proceeds that we expect to receive from our IPO, our Board believes that we will have sufficient working capital for a period of 12 months from the date of this Prospectus.

(ii) Cash flows

The following table sets out a summary of our consolidated statements of cash flows for the years indicated.

	Year ended 31 December		
	2014	2015	2016
		(RM million)	
Net cash flow			
Net cash generated from operating activities	409.1	1,803.7	1,968.8
Net cash used in investing activities	(184.7)	(142.0)	(2,382.0)
Net cash used in financing activities	(230.6)	(468.5)	(70.2)
Net (decrease)/increase in cash and cash equivalents	(6.2)	1,193.2	(483.4)
Cash and cash equivalents at beginning of year	175.8	184.0	1,511.0
Cash and cash equivalents at end of year	**184.0**	**1,511.0**	**1,040.3**

Our Board is of the opinion that, save as set out in Section 15.4(x) of the Prospectus, there are no legal, financial or economic restrictions on our subsidiaries' ability to transfer funds to our Company in the form of cash dividends, loans or advances to meet our cash obligations, subject to availability of distributable reserves and/or loans or advances and compliance with legal requirements and financial covenants.

(b) *Net cash generated from operating activities*

Year ended 31 December 2016

For the year ended 31 December 2016, we generated operating profit before working capital changes of RM2,203.7 million. Our net cash generated from operating activities after taking into account the following key items, was RM1,968.8 million:

(i) a RM41.1 million increase in trade and other payables primarily due to higher cost of goods sold on account of higher feedstock prices towards the end of the year;

(ii) a RM21.7 million decrease in inventories primarily due to improved sales towards the end of 2016 from increased sales of polypropylene and pygas;

(iii) a RM277.9 million increase in trade and other receivables primarily due to a downpayment of RM142.0 million for PT LC Indonesia's land use rights and increased trade receivables from the sales of butadiene, polypropylene and pygas; and

(iv) payment of RM14.7 million on income tax, RM4.7 million on finance costs and RM0.4 million under our defined benefit plan.

Year ended 31 December 2015

For the year ended 31 December 2015, we generated operating profit before working capital changes of RM1,506.6 million. Our net cash generated from operating activities after taking into account the following key items, was RM1,803.7 million:

(i) a RM258.2 million decrease in inventories primarily due to a decrease in the value of our products resulting from the decline in feedstock prices;

(ii) a RM156.4 million decrease in trade and other receivables primarily due to the decrease in our average sales prices resulting from the decline in feedstock prices;

(iii) a RM100.5 million decrease in trade and other payables primarily due to the decrease in the cost of goods sold on account of lower feedstock price; and

(iv) payment of RM9.3 million on income taxes, RM7.3 million on finance costs and RM0.4 million under our defined benefit plan.

Year ended 31 December 2014

For the year ended 31 December 2014, we generated operating profit before working capital changes of RM409.7 million. Our net cash generated from operating activities after taking into account the following key items, was RM409.1 million:

(i) a RM131.2 million decrease in trade and other receivables primarily due to a decrease in our average sales prices resulting from the decline in feedstock prices;

(ii) a RM128.4 million decrease in inventories primarily due to a decrease in feedstock price and a decrease in the quantity of naphtha purchased towards the end of the year;

(iii) a RM243.2 million decrease in trade and other payables primarily due to a decline in feedstock price and a decrease in the quantity of naphtha purchased towards the end of the year; and

(iv) payment of RM1.0 million on income taxes, RM15.3 million on finance costs and RM0.7 million under our defined benefit plan.

(b) *Net cash used in investing activities*

Year ended 31 December 2016

Net cash used in investing activities was RM2,382.0 million in the year ended 31 December 2016, which consisted primarily of:

(i) RM1,388.7 million spent on investments in our associate, LC USA for our proportionate share of investment in the US Shale Gas Project; and

(ii) RM1,001.0 million on acquisitions of property, plant and equipment. For a description of amounts that we spent on property, plant and equipment in the year ended 31 December 2016, please refer to Section 12.2.6(v) below.

Year ended 31 December 2015

Net cash used in investing activities was RM142.0 million in the year ended 31 December 2015, which consisted primarily of RM157.6 million spent on acquisitions of property, plant and equipment. For a description of amounts that we spent on property, plant and equipment in the year ended 31 December 2015, please refer to Section 12.2.6(v) below.

Year ended 31 December 2014

Net cash used in investing activities was RM184.7 million in the year ended 31 December 2014, which consisted primarily of RM154.5 million spent on acquisitions of property, plant and equipment. For a description of amounts that we spent on property, plant and equipment in the year ended 31 December 2014, please refer to Section 12.2.6(v) of this Prospectus. We also spent RM20.6 million to acquire a leasehold land in Pasir Gudang for potential future expansion.

(c) *Net cash used in financing activities*

Year ended 31 December 2016

Net cash used in financing activities was RM70.2 million for the year ended 31 December 2016, primarily on the repayment of long-term borrowings in an amount equivalent to RM68.2 million on our secured USD term loan due in September 2017.

Year ended 31 December 2015

Net cash used in financing activities was RM468.5 million for the year ended 31 December 2015, and primarily comprised:

(i) net repayments of short-term borrowings of RM189.2 million, comprising payments equivalent to RM86.8 million and RM102.4 million on bankers' acceptances and on-shore foreign currency loans, respectively;

(ii) repayments of long-term borrowings of RM171.7 million, comprising payments equivalent to RM64.5 million on secured USD term loan due and full repayment of our bond and *Sukuk* on maturity, with payments equivalent to RM28.7 million and RM78.5 million, respectively; and

(iii) payment of a dividend of RM101.2 million.

Year ended 31 December 2014

Net cash used in financing activities was RM230.6 million for the year ended 31 December 2014 primarily comprising:

(i) the repayment of long-term borrowings of RM246.7 million, including to fully repay a term loan due in 2014; and

(ii) net repayments of short-term borrowings of RM123.8 million to partly repay bankers' acceptances and an on-shore foreign currency loan.

We refinance the term loan due in 2014 with a secured USD term loan facility of USD50 million (equivalent to RM159.7 million) which we had obtained in the same year.

(iii) Borrowings

As at 31 December 2016, we had total outstanding loans and borrowings of USD16.8 million (equivalent to RM75.4 million based on the exchange rate of USD1:RM4.486 as at 31 December 2016), all of which was outstanding under our secured USD term loan due in September 2017. This term loan bears interest at an annual rate of LIBOR (the London Interbank Offered Rate) plus 1.25% and is secured by a corporate guarantee from our Company and a negative pledge over the assets, revenues and business of our subsidiary, LCTM. For the year ended 31 December 2016, we paid an average effective annual interest rate of 1.93% on this facility.

We have not defaulted on any payments for our borrowings throughout the year ended 31 December 2016 up to the LPD. As at the LPD, we are not in breach of any terms and conditions or covenants associated with our borrowings which can materially affect our financial position and results or business operations, or the investments in our Shares.

The table below sets out our loans and borrowings for the years indicated.

	2014	2015	2016
		(RM million)	
Non-current			
Secured:			
Term loan	116.7	72.2	-
Current			
Secured:			
Term loan	58.0	71.3	75.4
Bond	20.4	-	-
Sukuk	55.9	-	-
Bankers' acceptances	77.0	-	-
On-shore foreign currency loan	90.9	-	-
	302.2	71.3	75.4
Total loans and borrowings	**418.9**	**143.5**	**75.4**

The remaining maturities of the loans and borrowings as at 31 December 2014, 2015 and 2016 are as follows:

	2014	2015	2016
		(RM million)	
On demand or within one year	302.2	71.3	75.4
More than 1 year and less than 2 years	58.0	72.2	-
More than 2 years and less than 5 years	58.7	-	-
	418.9	**143.5**	**75.4**

(iv) Key financial ratios

The following table sets out certain of our key financial ratios for the years indicated:

	Year ended 31 December		
	2014	2015	2016
Average trade receivables turnover (days)[(1)]	32.3	32.2	35.5

	Year ended 31 December		
	2014	2015	2016
Average trade payables turnover (days)[2]	26.6	25.1	25.5
Average inventory turnover (days)[3]	16.9	20.1	20.3
Current ratio (times)[4]	2.3	5.3	5.0
Gearing ratio (times)[5]	0.09	0.02	0.01

Notes:

(1) Computed as an average of the opening and closing trade receivables for the period divided by revenue during the period, multiplied by the number of days in the period.

(2) Computed as an average of the opening and closing trade payables for the period divided by the sum of the change in inventory and cost of goods sold during the period, multiplied by the number of days in the period.

(3) Computed as an average of the opening and closing finished goods for the period divided by cost of goods sold during the period, multiplied by the number of days in the period.

(4) Computed as current assets over current liabilities.

(5) Computed as total borrowings over total equity.

(a) *Trade receivables*

As at 31 December 2016, total trade receivables amounted to RM860.5 million. The credit period that we typically extend to our customers is between 30 to 45 days depending on the financial position and credit history of the customer and whether any guarantee or collateral is provided. Our average trade receivables turnover remained relatively steady from the year ended 31 December 2014 through the year ended 31 December 2016 and has remained within the normal credit terms that we extend to our customers.

The aging analysis for trade receivables as at 31 December 2014, 2015 and 2016 is as follows:

	Current	1-30 days	31-60 days	61-90 days	More than 90 days	Total
	(RM millions, except percentages)					
2014						
Trade receivables as at 31 December 2014	620.4	92.2	4.6	1.8	2.3	721.3
Impairment	-	-	-	-	1.6	1.6
Trade receivables (net)	**620.4**	**92.2**	**4.6**	**1.8**	**0.7**	**719.7**
% of total trade receivables	86.2	12.8	0.6	0.3	0.1	100.0
2015						
Trade receivables as at 31 December 2015	656.7	61.1	0.7	-	0.2	718.7
Impairment	-	-	-	-	0.2	0.2
Trade receivables (net)	**656.7**	**61.1**	**0.7**	**-**	**-**	**718.5**
% of total trade receivables	91.4	8.5	0.1	-	-	100.0
2016						
Trade receivables as at 31 December 2016	788.0	66.6	5.6	0.3	-	860.5
Impairment	-	-	-	-	-	-
Trade receivables (net)	**788.0**	**66.6**	**5.6**	**0.3**	**-**	**860.5**
% of total trade receivables	91.6	7.7	0.7	*	-	100.0

Note:

* Less than 0.1%

(b) *Trade payables*

The normal credit period given by our trade creditors generally are 30 days for feedstock purchases and 30 to 60 days for other purchases. Our average trade payables turnover remained relatively steady from the year ended 31 December 2014 through the year ended 31 December 2016 and has remained within the normal credit period that our trade creditors extend to us.

The aging analysis for trade payables as at 31 December 2014, 2015 and 2016 is as follows:

		Past Due				
	Current	1-30 days	31-60 days	61-90 days	More than 90 days	Total
	(RM millions, except percentages)					
2014						
Trade payables	**334.8**	**141.7**	**10.0**	**0.2**	**0.3**	**487.0**
% of total trade payables	68.7	29.1	2.1	*	0.1	100.0
2015						
Trade payables	**280.4**	**149.9**	**10.8**	**0.7**	**(0.4)[1]**	**441.4**
% of total trade payables	63.5	34.0	2.4	0.2	(0.1)	100.0
2016						
Trade payables	**250.3**	**117.3**	**40.5**	**0.6**	**1.7**	**410.4**
% of total trade payables	61.0	28.6	9.9	0.1	0.4	100.0

Notes:

* Less than 0.1%

(1) The negative figure arose due to a credit note received from one of our suppliers in the year ended 31 December 2015. We were billed for a quantity higher than what we received, and the amount was refunded by the supplier in the year ended 31 December 2016.

(c) *Inventory*

Generally, our inventory turnover period will depend on the expected demand from our customers for the type of products and also value of the inventories during the period. Typically, we will hold sufficient inventories of finished goods after taking into account the following:

(i) the production cycle which varies between 30 to 45 days, being the interval to produce the same type of product again. Please refer to Section 7.5 of this Prospectus for the information on the product cycle; and

(ii) shipping or delivery arrangement including timing and quantity as per customers' requirements.

This is to enable us to:

(i) provide regular supply to our customers because our customers do not place their orders at the same time although our customers typically place their orders on a monthly basis; and

(ii) fulfil unexpected orders by customers although we are not obliged to do so unless we have sufficient inventories after catering for regular orders from customers.

Our average inventory turnover period increased from 16.9 days in the year ended 31 December 2014 to 20.1 days in the year ended 31 December 2015. This was mainly due to the declining trend in feedstock prices from 31 December 2014 to 31 December 2015 which reduced our cost of goods sold by a larger amount than the reduction in value of our inventories. Our cost of goods sold is affected by the change in feedstock prices throughout the year while our inventory balances are only affected by the change in feedstock prices as at year end. The average feedstock prices throughout 2015 declined by 44.2% compared to that of 2014 while the feedstock prices as at year end declined by only 16.5% in 2015 as compared to that of 2014. Our product mix between the two years were largely the same.

Our average inventory turnover period remained relatively stable in the year ended 31 December 2016 at 20.3 days.

(d) *Current ratio*

Our current ratio increased significantly from 2.3 times in the year ended 31 December 2014 to 5.3 times in the year ended 31 December 2015. Current assets increased by RM1,288.9 million in the year ended 31 December 2015 mainly due to an increase in cash and bank balances by RM1,327.0 million which is in line with our increased profit for the year. Current liabilities also decreased by RM294.3 million mainly due to repayment of loans and borrowings as described above in Section 12.2.6(ii)(c) of this Prospectus.

Our current ratio decreased slightly from 5.3 times in the year ended 31 December 2015 to 5.0 times in the year ended 31 December 2016. Current assets decreased by RM208.0 million in the year ended 31 December 2016 mainly due to a decrease in cash and bank balances by RM470.7 million. While our profit was higher in the year ended 31 December 2016 by RM702.0 million, we also incurred RM2,382.0 million on investing activities which include investments in our associate, LC USA and acquisitions of property, plant and equipment which has resulted in a lower cash and bank balances. Current liabilities decreased slightly by RM12.0 million mainly due to lower trade and other payables.

(e) *Gearing ratio*

Our gearing ratio decreased significantly from 0.09 times in the year ended 31 December 2014 to 0.02 times in the year ended 31 December 2015, primarily due to the repayment of loans and borrowings as described above in Section 12.2.6(ii)(c) of this Prospectus. Our gearing ratio decreased slightly from 0.02 times in the year ended 31 December 2015 to 0.01 times in the year ended 31 December 2016 primarily due to an increase in our retained earnings resulting from higher net profit for 2016.

(v) Capital expenditures

The following table sets out our capital expenditures for each of the years ended 31 December 2014, 2015 and 2016.

	Year ended 31 December		
	2014	2015	2016
		(RM million)	
TE3 Project	16.5	115.7	821.5
PP3 Project	-	-	11.0
Turnaround	31.9	0.6	23.7
Improvements and modifications	106.1	41.3	144.8
Total	**154.5**	**157.6**	**1,001.0**

In the year ended 31 December 2014, our capital expenditures included RM31.9 million on scheduled turnaround, RM16.5 million on our TE3 Project and RM106.1 million on various improvements and modifications, including primarily RM26.5 million for the modification of butadiene heat exchangers and RM20.9 million on the installation of a butadiene pipeline to Lotte Ube's plant, which allows us to sell and transport butadiene to Lotte Ube.

In the year ended 31 December 2015, our capital expenditures included RM115.7 million on our TE3 Project and RM41.3 million on various improvements and modifications, primarily for our plants in Malaysia, the largest of which was RM9.2 million on catalyst replacements for the reactor in our OCU Plant.

In the year ended 31 December 2016, our capital expenditures included RM821.5 million on our TE3 Project, RM11.0 million on our PP3 Project, RM23.7 million on scheduled turnaround and RM144.8 million on various improvements and modifications, including primarily RM43.1 million on the replacement of cracked gas compressor turbines for our crackers, RM32.6 million on a gas turbine and RM9.2 million on the debottlenecking of our polypropylene plants.

Planned capital expenditures

The following table sets out our planned capital expenditures for the years indicated.

	Year ending 31 December				
	2017	2018	2019	2020	2021
			(RM million)		
TE3 Project	401.3	-	-	-	-
PP3 Project	432.3	182.2	-	-	-
Turnaround	354.6	-	-	40.6	-
Improvements and modifications	430.4	68.3	64.2	60.9	58.9
US Shale Gas Project	744.7	-	-	-	-
Integrated Petrochemical Facility	399.0	2,391.4	2,247.0	5,078.8	2,747.5
Others	31.0	9.1	8.6	8.1	7.9
Total	**2,793.3**	**2,651.0**	**2,319.8**	**5,188.4**	**2,814.3**

For a description of the above projects, please refer to Section 7.6.8 of this Prospectus.

Our actual capital expenditures may vary from projected amounts due to various factors, including changes in market conditions, our ability to generate sufficient cash flows from operations, our ability to obtain adequate financing for these capital expenditures, demand for our products and services, governmental policies regarding the industry in which we operate and the condition of the Malaysian, Indonesian, United States and global economies. In addition, our capital expenditures shown above do not include any expenditure for potential acquisitions or investments that we may evaluate from time to time. Please refer to Section 5.2.8 of this Prospectus.

We intend to fund these capital expenditures with cash and bank balances, cash generated from our operations and borrowings from financial institutions and, to the extent described in Section 4.7 of this Prospectus, the proceeds from the Public Issue. Our ability to obtain financing and to make timely repayments of our debt obligations are subject to various uncertainties, including our future results of operations, financial condition and cash flows, the condition of the Malaysian, Indonesian, United States and global economies, the petrochemical cycle, the cost of finance, the condition of financial markets and the willingness of financial institutions to provide financing to us.

(vi) Capital commitments and contractual obligations

We had capital commitments of RM1,774.3 million as at 31 December 2016. These commitments consisted of the following:

	RM million
Contracted but not provided for	672.4
Approved but not contracted for	1,101.9
Total	**1,774.3**

Our capital commitments as at 31 December 2016 primarily related to the construction of our TE3 Project and PP3 Project, which are RM404.1 million and RM616.7 million, respectively. For more information on these projects, please refer to Section 4.7.1 of this Prospectus.

We do not provide a maturity analysis of our capital commitments because there is uncertainty as to the timing when many of our capital commitments will become due. For example, our construction contracts for our upcoming projects often include milestone payments, whereby we are only obligated to pay our contractors upon construction reaching certain key milestones.

We had the following contractual obligations as at 31 December 2016:

	Year ending 31 December						
	2017	**2018**	**2019**	**2020**	**2021**	**After 2021**	**Total**
				(RM million)			
Long-term debt	75.4	-	-	-	-	-	75.4
Operating lease	10.0	10.0	9.0	8.0	8.0	35.0	80.0
Unconditional purchase obligations[1]	703.1	702.4	660.4	232.4	215.9	543.1	3,057.3
Total contractual obligations	**788.5**	**712.4**	**669.4**	**240.4**	**223.9**	**578.1**	**3,212.70**

Note:

(1) The actual amounts that we pay under our unconditional purchase obligations may differ from those set out in this table for a variety of reasons, in particular because the prices that we use to compute the unconditional purchase obligations are subject to change based on, among others, changes in the consumer price index, prevailing power tariffs, future government policies and market prices.

We also are party to a power purchase agreement in Indonesia through which we purchase electricity to supply power to our Indonesian plants. Under the terms of this agreement, the agreement is automatically extended until we or our counterparty give notice to terminate. Because this agreement is perpetual until either party gives a termination notice, we have not included amounts from this contract in the above table. The amounts that we paid under this agreement in the years ended 2014, 2015 and 2016 were RM52.9 million, RM62.6 million and RM65.8 million, respectively.

(vii) Contingent liabilities

Our Board confirms that as at the LPD, we have no pending contingent liabilities that, upon becoming enforceable, may have a material impact on our results of operation or financial condition.

(viii) Material divestitures

There has not been any material divestiture undertaken by us for the year ended 31 December 2014, 2015 and 2016, as well as up to the LPD. As at the LPD, we do not have any uncompleted material divestiture.

12.2.7 Financial risk management

We are exposed to markets risks arising from our operations and use of financial instruments. Our key market risk exposures are to fluctuations in commodity prices, interest rates and foreign currency exchange rates as described in Section 5.4.2 of this Prospectus.

(i) Commodity price risk

Most of our products and substantially all of our raw materials are commodities whose prices fluctuate based on market conditions. Accordingly, our product margins and profitability fluctuate in accordance with commodity price movements. We manage commodity price risk by adjusting our product mix so that products are subject to different margin pressures. We do not currently use derivatives or other hedging instruments to manage our commodity price risk. Please refer to Section 12.2.2(iii) of this Prospectus.

(ii) Interest rate risk

Interest rate risk is the risk that the fair value of future cash flows of a financial instrument will fluctuate because of changes in market interest rates. Our primary interest rate risk relates to our interest-bearing borrowings. We manage our interest rate exposure by using a mix of fixed and floating rate debts and actively reviewing our debt portfolio, taking into account the nature of our business and operations.

A 100 basis point increase or decrease in interest rates would have increased or decreased our post-tax profit or loss by the amounts set out below, assuming that all other variables, in particular foreign currency rates, remain constant:

	Increase/(decrease)		
	2014	2015	2016
		(RM million)	
Interest rates increase by 100 basis points	(1.3)	(1.1)	(0.6)
Interest rates decrease by 100 basis points	1.3	1.1	0.6

(iii) Foreign currency risk

Foreign currency risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in foreign exchange rates. We are exposed to transactional currency exposure primarily through sales and purchases that are denominated in a currency other than the functional currency of the operations to which they relate. Substantially all of our feedstock purchases and all of our sales outside Malaysia and Indonesia are denominated in USD. However, other than feedstock purchases, most of our expenses and sales in Malaysia are denominated in RM, and most of our expenses and sales in Indonesia are denominated in IDR. Even though we transact our business other than feedstock purchases in Malaysia and Indonesia in their respective local currencies, to an extent we benefit from a natural hedge, as the sales prices of most of our products are based on international pricing benchmarks denominated in USD.

Transactions in foreign currencies are measured in the respective functional currencies of our Group and are recorded on initial recognition in the functional currencies at exchange rates approximating those ruling at the transaction dates. Monetary assets and liabilities denominated in foreign currencies are translated at the rate of exchange ruling at the reporting date. Non-monetary items denominated in foreign currencies that are measured at historical cost are translated using the exchange rates as at the dates of the initial transactions.

We do not have a formal hedging policy with respect to foreign exchange exposure. Rather, we monitor foreign exchange exposure on an on-going basis and endeavour to keep net exposures to an acceptable level.

The following table demonstrates the sensitivity of our profit net of tax to a reasonably possible change in the RM/USD and IDR/USD exchange rates, with all other variables held constant:

	Increase/(decrease)		
	2014	2015	2016
		(RM million)	
RM/USD			
Strengthening of RM by 10% (2015: 10%; 2014: 10%)	6.8	16.8	23.6
Weakening of RM by 10% (2015: 10%; 2014: 10%)	(6.8)	(16.8)	(23.6)
IDR/USD			
Strengthening of IDR by 10% (2015: 10%; 2014: 10%)	(5.2)	5.5	6.2
Weakening of IDR by 10% (2015: 10%; 2014: 10%)	5.2	(5.5)	(6.2)

(iv) Liquidity risk

Liquidity risk is the risk that we will encounter difficulty in meeting financial obligations due to shortages of funds. Our exposure to liquidity risk arises primarily from mismatches of the maturities of financial assets and liabilities. We maintain a level of cash and cash equivalents and bank facilities that we deem adequate to ensure, as far as possible, that we will have sufficient liquidity to meet our liabilities when they fall due. As at 31 December 2016, we had RM696.7 million in undiscounted financial liabilities due on demand or within one year.

(v) Credit risk

Credit risk is the risk of loss that may arise on outstanding financial instruments should a counterparty default on its obligations. Our exposure to credit risk arises primarily from trade and other receivables. For other financial assets (including cash and bank balances and derivatives), we minimise credit risk by dealing with high credit rating counterparties. Our policy is that all customers who wish to trade on credit terms are subject to credit verification procedures. In addition, we monitor receivables balances on an ongoing basis with the result that our exposure to bad debts is not significant.

We do not have any significant exposure to any individual customer or counterparty nor do we have any major concentration of credit risk related to any financial assets.

12.2.8 Seasonality

We do not typically experience significant seasonality in our business operations.

12.2.9 Inflation

Inflation has not had a material impact on our results of operations in recent years.

12.2.10 Order book

Due to the nature of our business, we do not maintain an order book.

12.2.11 Prospects and trends

Save as disclosed in this section and in the Section 5 of this Prospectus, there are no other known factors, trends, uncertainties, demands, commitments or events that are reasonably likely to have a material effect on our business, financial condition and results of operations.

12.2.12 Significant changes

Save as disclosed in this Prospectus, no significant changes have occurred which may have a material effect on the financial position and results of our Group since the year ended 31 December 2016.

12.2.13 Impact of government, economic, fiscal or monetary policies

For information on any government, economic, fiscal or monetary policies or factors which could materially affect our operations, please refer to Section 7.14 and Section 15.4(x) of this Prospectus.

12.2.14 Accounting standards issued but not yet effective

For a description of accounting standards issued but not yet effective, please refer to Note 2.2 to the Accountants' Report included in Section 13 of this Prospectus.

12.2.15 Treasury Policies and Objectives

One of the main treasury responsibilities is to ensure that we have the liquidity and cash to meet our obligations as they fall due. Our principal sources of liquidity are our cash and bank balances, cash generated from our operations and borrowings from financial institutions. Using appropriate governance and policies, it is the responsibility of treasury to identify, quantify, monitor and control the risks (liquidity, interest, currency, credit, legal and regulatory) associated with these activities, using appropriate mitigation and hedging techniques.

We will be exposed to currency exchange risk as a portion of our cash and cash equivalents are held in RM and IDR. Our treasury has the mandate to enter into simple forward exchange contracts with stipulated limits in the amount and duration, to mitigate potential currency exchange losses.

In terms of borrowings, we adopt both fixed and floating interest rate for our trade loans and term loan respectively.

12.3 CAPITALISATION AND INDEBTEDNESS

The table below presents our capitalisation and indebtedness as at 30 April 2017 based on our unaudited management accounts on the assumption that our IPO, Listing and the use of proceeds arising from the Public Issue as set out in Section 4.7 of this Prospectus ("**Use of Proceeds**") had occurred on 30 April 2017.

The pro forma financial information below does not represent our actual capitalisation and indebtedness as at 30 April 2017 and is provided for illustrative purposes only.

	As at 30 April 2017	After our IPO, Listing and Use of Proceeds
	(RM million)	
Indebtedness		
Loans and borrowings		
Current		
Term loan – secured [1]	37.0	37.0
Bank overdraft - secured [2]	12.0	12.0
Total indebtedness	**49.0**	**49.0**
Total equity attributable to owner of the Company	**7,946.8**	**13,726.3**
Non-controlling interests	**28.6**	**28.6**
Total equity/capitalisation	**7,975.4**	**13,754.9**
Total capitalisation and indebtedness	**8,024.4**	**13,803.9**

Notes:

(1) The term loan is secured by:

(a) A corporate guarantee from our Company; and

(b) A negative pledge over the assets, revenue and business of our subsidiary, LCTM.

(2) The bank overdraft is secured by a corporate guarantee from our Company.

12.4 PRO FORMA CONSOLIDATED STATEMENT OF FINANCIAL POSITION

The consolidated statement of financial position has been derived from the Pro Forma Consolidated Statement of Financial Position as at 31 December 2016 has been prepared in accordance with the approved accounting standards and in a manner consistent with the format of the statement of financial position and the accounting policies adopted by our Group. The financial statements of our Group for the year ended 31 December 2016 were prepared in accordance with the MFRS and IFRS.

The pro forma consolidated statement of financial position as at 31 December 2016 has been prepared for illustrative purposes only to show the effects of our IPO, Listing and the Use of Proceeds, had these transactions been effected on 31 December 2016.

The pro forma consolidated statement of financial position should be read in conjunction with the Reporting Accountants' Letter on the Compilation of Pro Forma Financial Information as set out in Section 12.5 of this Prospectus.

The pro forma consolidated statement of financial position is not necessarily indicative of the financial position that would have been attained had the abovementioned transactions actually occurred on 31 December 2016. The pro forma consolidated statement of financial position has been prepared for illustrative purposes only, and because of its nature, may not give a true picture of the actual financial position of our Group.

	As at 31 December 2016	After subsequent adjustments	After our IPO, the Listing and use of proceeds
	RM'000	RM'000	RM'000
Non-current assets			
Property, plant and equipment	4,378,823	4,378,823	10,149,823
Prepaid lease payments	36,278	36,278	36,278
Investments in associates	1,552,117	1,552,117	1,552,117
Deferred tax assets	160	160	160
Derivative financial instruments	11,369	11,369	11,369
	5,978,747	**5,978,747**	**11,749,747**
Current assets			
Inventories	1,147,072	1,147,072	1,147,072
Trade and other receivables	1,143,346	1,143,346	1,143,346
Tax recoverable	8,805	8,805	8,805
Prepayments	21,008	21,008	21,008
Derivative financial instruments	1,169	1,169	1,169
Cash and bank balances	1,040,344	1,040,344	1,040,344
	3,361,744	**3,361,744**	**3,361,744**
Total assets	**9,340,491**	**9,340,491**	**15,111,491**
Equity and liabilities			
Capital and reserves			
Share capital	1,727,792	[(1)]2,046,813	7,970,677
Share premium	294,113	[(1)]-	-
Other reserves	1,943,750	[(1)]1,918,842	1,918,842
Retained earnings	3,981,743	3,981,743	3,828,879
Total equity attributable to owner of the Company	7,947,398	7,947,398	13,718,398
Non-controlling interests	22,022	22,022	22,022
Total equity	**7,969,420**	**7,969,420**	**13,740,420**
Non-current liabilities			
Loans and borrowings	-	-	-
Provision	325,919	325,919	325,919
Deferred tax liabilities	364,440	364,440	364,440

	As at 31 December 2016	After subsequent adjustments	After our IPO, the Listing and use of proceeds
	RM'000	RM'000	RM'000
Defined benefit obligation	14,967	14,967	14,967
	705,326	**705,326**	**705,326**
Current liabilities			
Loans and borrowings	75,365	75,365	75,365
Trade and other payables	590,182	590,182	590,182
Other financial liabilities	198	198	198
Derivative financial instruments	-	-	-
	665,745	**665,745**	**665,745**
Total liabilities	**1,371,071**	**1,371,071**	**1,371,071**
Total equity and liabilities	**9,340,491**	**9,340,491**	**15,111,491**

Note:

(1) Adjustment made to illustrate the transfer of the share premium account and capital redemption reserve as at 31 December 2016 to share capital in accordance with the transitional provision in Section 618(2) of the Act.

12.5 REPORTING ACCOUNTANTS' LETTER ON THE COMPILATION OF PRO FORMA FINANCIAL INFORMATION

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REPORTING ACCOUNTANTS' LETTER ON THE COMPILATION OF PRO FORMA FINANCIAL INFORMATION

The Board of Directors
Lotte Chemical Titan Holding Berhad
6th Floor, Bangunan Malaysian Re
No. 17, Lorong Dungun
Damansara Heights
50490 Kuala Lumpur

Dear Sirs

Lotte Chemical Titan Holding Berhad ("the Company")
Report on the compilation of pro forma financial information for inclusion in the Company's prospectus in connection with the listing of and quotation for the entire issued share capital of the Company on the Main Market of Bursa Malaysia Securities Berhad

We have completed our assurance engagement to report on the compilation of pro forma financial information of Lotte Chemical Titan Holding Berhad and its subsidiaries ("the Group") prepared by the Directors. The pro forma financial information consists of the pro forma consolidated statement of financial position as at 31 December 2016 and the related notes as set out in Attachment A.

The applicable criteria on the basis of which the Directors have compiled the pro forma financial information are specified in the Prospectus Guidelines - Equity issued by the Securities Commission Malaysia ("Prospectus Guidelines") and described in Note 3 of Attachment A.

The pro forma financial information has been compiled by the Directors to illustrate the impact of the events or transactions as set out in Note 2 of Attachment A on the Group's financial position as at 31 December 2016, as if those events or transactions had taken place on 31 December 2016. As part of this process, information about the Group's financial position has been extracted by the Directors from the financial statements of the Group for the financial year ended 31 December 2016, on which an audit report has been published.

Directors' responsibility for the pro forma financial information

The Directors are responsible for compiling the pro forma financial information on the basis of applicable criteria as described in Note 3 in Attachment A.

Report on the compilation of pro forma financial information for inclusion in the Company's prospectus in connection with the listing of and quotation for the entire issued share capital of the Company on the Main Market of Bursa Malaysia Securities Berhad
(cont'd)

Reporting accountants' independence and quality control

We are independent in accordance with the By-Laws (on Professional Ethics, Conduct and Practice) of the Malaysian Institute of Accountants ("By-Laws") and the International Ethics Standards Board for Accountants' Code of Ethics for Professional Accountants ("IESBA Code"), and we have fulfilled our other ethical responsibilities in accordance with the By-Laws and the IESBA Code.

The firm applies International Standard on Quality Control 1 ("ISQC 1"), *Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance and Related Services Engagements* and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Reporting accountants' responsibilities

Our responsibility is to express an opinion, as required by the Prospectus Guidelines, about whether the pro forma financial information has been compiled, in all material respects, by the Directors on the basis of the applicable criteria as described in Note 3 in Attachment A.

We conducted our engagement in accordance with the Malaysia Approved Standard on Assurance Engagements, ISAE 3420, *Assurance Engagements to Report on the Compilation of Pro Forma Financial Information Included in a Prospectus,* issued by the Malaysian Institute of Accountants. This standard requires that we comply with ethical requirements and plan and perform procedures to obtain reasonable assurance about whether the Directors have compiled, in all material respects, the pro forma financial information on the basis of the applicable criteria as described in Note 3 in Attachment A.

For the purpose of this engagement, we are not responsible for updating or reissuing any reports or opinions on any historical financial information used in compiling the pro forma financial information, nor have we, in the course of this engagement, performed an audit or review of the financial information used in compiling the pro forma financial information.

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Report on the compilation of pro forma financial information for inclusion in the Company's prospectus in connection with the listing of and quotation for the entire issued share capital of the Company on the Main Market of Bursa Malaysia Securities Berhad
(cont'd)

Reporting accountants' responsibilities (cont'd)

The purpose of the pro forma financial information included in the prospectus is solely to illustrate the impact of a significant event or transaction on unadjusted financial information of the Group as if the event had occurred or the transaction had been undertaken at an earlier date selected for purposes of the illustration. Accordingly, we do not provide any assurance that the actual outcome of the event or transaction would have been as presented.

A reasonable assurance engagement to report on whether the pro forma financial information has been compiled, in all materials respects, on the basis of the applicable criteria involves performing procedures to assess whether the applicable criteria used by the Directors in the compilation of the pro forma financial information provide a reasonable basis for presenting the significant effects directly attributable to the event or transaction, and to obtain sufficient appropriate evidence about whether:

- the related pro forma adjustments give appropriate effects to those criteria; and
- the pro forma financial information reflects the proper application of those adjustments to the unadjusted financial information.

The procedures selected depend on our judgement, having regard to our understanding of the nature of the Group, the event or transaction in respect of which the pro forma financial information has been compiled, and other relevant engagement circumstances.

The engagement also involves evaluating the overall presentation of the pro forma financial information.

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Opinion

In our opinion, the pro forma financial information has been compiled, in all material respects, on the basis of the applicable criteria as stated in Note 3 in Attachment A.

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Report on the compilation of pro forma financial information for inclusion in the Company's prospectus in connection with the listing of and quotation for the entire issued share capital of the Company on the Main Market of Bursa Malaysia Securities Berhad
(cont'd)

Other matters

This letter is issued for the sole purpose of inclusion in the prospectus of the Company in connection with the listing of and quotation for the entire issued share capital of Lotte Chemical Titan Holding Berhad on the Main Market of Bursa Malaysia Securities Berhad ("Proposed Transaction") and should not be relied upon for any other purposes. Our work had been carried out in accordance with Malaysian Approved Standards on Assurance Engagements and accordingly should not be relied upon as if it had been carried out in accordance with standards and practices in other jurisdictions. Therefore, this letter is not appropriate in other jurisdictions and should not be used or relied upon for any purpose other than the Proposed Transaction described above. We accept no duty or responsibility to and deny any liability to any party in respect of any use of, or reliance upon, this letter in connection with any type of transaction, including the sale of securities other than the Proposed Transaction.

Ernst & Young
AF 0039
Chartered Accountants

Lee Ming Li
2983/03/18(J)
Chartered Accountant

Johor Bahru, Malaysia
Date: 2 June 2017

Attachment A

Lotte Chemical Titan Holding Berhad
Pro forma consolidated statement of financial position as at 31 December 2016 and the notes thereon

1. Introduction

The pro forma consolidated statement of financial position as at 31 December 2016 of Lotte Chemical Titan Holding Berhad ("the Company") and its subsidiaries ("the Group"), for which the Directors are solely responsible, has been prepared for illustrative purposes only, for inclusion in the prospectus of the Company in connection with the initial public offering of ordinary shares in the Company ("IPO") and listing of and quotation for the entire issued share capital of the Company on the Main Market of Bursa Malaysia Securities Berhad ("Listing") ("Prospectus").

2. Proposed Scheme

2.1 IPO and Listing

The IPO and Listing will involve the following:

(a) The public issue of 740,483,000 new ordinary shares in the Company ("Issue Shares") representing approximately 30.00% of the enlarged issued share capital of the Company at a price of RM8.00 per Issue Share.

(b) Listing of and quotation for the enlarged issued share capital of the Company, comprising 2,468,274,500 shares, on the Main Market of Bursa Malaysia Securities Berhad.

2.2 Utilisation of proceeds

The proceeds from the IPO of RM5,923,864,000 is intended to be utilised as follows:

	RM'000
Expansion of business:	
- PP3 Project - New propylene plant	620,000
- TE3 Project - Extension to existing naphtha cracker plant	220,000
- Integrated petrochemical facility in Indonesia	4,931,000
Estimated listing expenses	152,864
	5,923,864

The estimated listing expenses totaling RM152,864,000 comprise professional fees, fees to authorities, underwriting, placement and brokerage fees and miscellaneous expenses.

Attachment A

Lotte Chemical Titan Holding Berhad
Pro forma consolidated statement of financial position as at 31 December 2016 and the notes thereon
(cont'd)

3. Basis of preparation

The pro forma consolidated statement of financial position as at 31 December 2016 has been compiled based on the audited financial statements of the Group for the financial year ended 31 December 2016 and in a manner consistent with the format of the financial statements and the accounting policies adopted by the Group. The audited financial statements of the Group for the financial year ended 31 December 2016 were prepared in accordance with Malaysia Financial Reporting Standards ("MFRS") and International Financial Reporting Standards ("IFRS").

The pro forma consolidated statement of financial position as at 31 December 2016 has been prepared for illustrative purposes only to show the effects of the transactions as described in Note 2, with the assumption that these transactions were completed on 31 December 2016. The pro forma consolidated statement of financial position is not necessarily indicative of the financial position that would have been attained had the Proposed Scheme actually occurred at the respective dates. Accordingly, such information, because of its nature, may not be reflective of the actual financial position of the Group and does not purport to predict the future financial position of the Group.

The pro forma consolidated statement of financial position as at 31 December 2016 is presented in RM and all values are rounded to the nearest thousand (RM'000) except when otherwise indicated.

The pro forma consolidated statement of financial position of the Group as at 31 December 2016 were adopted and approved by the Board of Directors on 2 June 2017.

Attachment A

Lotte Chemical Titan Holding Berhad
Pro forma consolidated statement of financial position as at 31 December 2016 and the notes thereon
(cont'd)

4. Pro forma consolidated statement of financial position

	Note	As at 31.12.2016	Adjustment (Note 5.1)	Adjusted 31.12.2016	Proposed Scheme (Note 5.2)	Pro Forma I
		RM'000	RM'000	RM'000	RM'000	RM'000
Assets						
Non-current assets						
Property, plant and equipment	5.2.1	4,378,823		4,378,823	5,771,000	10,149,823
Prepaid lease payments		36,278		36,278	-	36,278
Investments in associates		1,552,117		1,552,117	-	1,552,117
Deferred tax assets		160		160	-	160
Derivative financial instruments		11,369		11,369	-	11,369
		5,978,747		5,978,747	5,771,000	11,749,747
Current assets						
Inventories		1,147,072		1,147,072	-	1,147,072
Trade and other receivables		1,143,346		1,143,346	-	1,143,346
Tax recoverable		8,805		8,805	-	8,805
Prepayments		21,008		21,008	-	21,008
Derivative financial instruments		1,169		1,169	-	1,169
Cash and bank balances	5.2.2	1,040,344		1,040,344	-	1,040,344
		3,361,744		3,361,744	-	3,361,744
Total assets		9,340,491		9,340,491	5,771,000	15,111,491

Attachment A

Lotte Chemical Titan Holding Berhad
Pro forma consolidated statement of financial position as at 31 December 2016 and the notes thereon
(cont'd)

4. Pro forma consolidated statement of financial position (cont'd)

	Note	As at 31.12.2016	Adjustment (Note 5.1)	Adjusted 31.12.2016	Proposed Scheme (Note 5.2)	Pro Forma I
		RM'000	RM'000	RM'000	RM'000	RM'000
Equity and liabilities						
Capital and reserves						
Share capital	5.2.3	1,727,792	319,021	2,046,813	5,923,864	7,970,677
Share premium	5.2.4	294,113	(294,113)	-	-	-
Other reserves	5.2.5	1,943,750	(24,908)	1,918,842	-	1,918,842
Retained earnings	5.2.6	3,981,743		3,981,743	(152,864)	3,828,879
Total equity attributable to owner of the Company		7,947,398		7,947,398	5,771,000	13,718,398
Non-controlling interests		22,022		22,022	-	22,022
		7,969,420		7,969,420	5,771,000	13,740,420
Non-current liabilities						
Provision		325,919		325,919	-	325,919
Deferred tax liabilities		364,440		364,440	-	364,440
Defined benefit obligation		14,967		14,967	-	14,967
		705,326		705,326	-	705,326
Current liabilities						
Loans and borrowings		75,365		75,365	-	75,365
Trade and other payables		590,182		590,182	-	590,182
Other financial liabilities		198		198	-	198
		665,745		665,745	-	665,745
Total liabilities		1,371,071		1,371,071	-	1,371,071
Total equity and liabilities		9,340,491		9,340,491	5,771,000	15,111,491
Supplementary information						
Number of ordinary shares ('000)		1,727,792		1,727,792		2,468,275
Net assets (RM'000)*		7,969,420		7,969,420		13,740,420
Net assets per share (RM)		4.61		4.61		5.57

* Net assets represent total assets less total liabilities

Attachment A

Lotte Chemical Titan Holding Berhad
Pro forma consolidated statement of financial position as at 31 December 2016 and the notes thereon
(cont'd)

5. Effects on the pro forma consolidated statement of financial position

The pro forma consolidated statement of financial position is prepared for illustrative purposes only to show the effects of the transactions described in Note 2, with the assumption that these transactions were completed on 31 December 2016.

5.1 Adjustment

On 31 January 2017, the Companies Act 2016 ("CA 2016") came into operation. Consequently, entities shall comply with CA 2016 in the preparation of financial statements for the financial years ending on or after 31 January 2017.

Section 74 of CA 2016 states that all shares issued before or after 31 January 2017 shall have no par or nominal value. CA 2016 provides certain transitional provisions relating to the abolition of nominal value. Section 618(2) of CA 2016 states that upon the commencement of Section 74 of CA 2016, the share premium account and capital redemption reserve shall become part of share capital.

This adjustment is made to illustrate the transfer of the share premium account and capital redemption reserve as at 31 December 2016 to share capital in accordance with the transitional provision in Section 618(2) of CA 2016, to reflect the share capital of the Company upon the actual completion of the Proposed Scheme.

5.2 Proposed Scheme

5.2.1 Property, plant and equipment

	RM'000
As at 31 December 2016	4,378,823
Effects of Proposed Scheme:	
- Utilisation of proceeds from the IPO	
- Expansion of business	
- PP3 Project - New propylene plant	620,000
- TE3 Project - Extension to existing naphtha cracker plant	220,000
- Integrated petrochemical facility in Indonesia	4,931,000
Pro Forma I	10,149,823

Attachment A

Lotte Chemical Titan Holding Berhad
Pro forma consolidated statement of financial position as at 31 December 2016 and the notes thereon
(cont'd)

5. Effects on the pro forma consolidated statement of financial position (cont'd)

5.2 Proposed Scheme (cont'd)

5.2.2 Cash and bank balances

	RM'000
As at 31 December 2016	1,040,344
Effects of Proposed Scheme:	
- Proceeds from the IPO	5,923,864
- Utilisation of proceeds from the IPO	
(i) Expansion of business	
- PP3 Project - New propylene plant	(620,000)
- TE3 Project - Extension to existing naphtha cracker plant	(220,000)
- Integrated petrochemical facility in Indonesia	(4,931,000)
(ii) Estimated listing expenses	(152,864)
Pro Forma I	1,040,344

5.2.3 Share capital

	RM'000
As at 31 December 2016	1,727,792
Effect of implementation of CA 2016	319,021
Effects of Proposed Scheme:	
- Increase in share capital arising from IPO	5,923,864
Pro Forma I	7,970,677

5.2.4 Share premium

	RM'000
As at 31 December 2016	294,113
Effect of implementation of CA 2016	(294,113)
Pro Forma I	-

Attachment A

Lotte Chemical Titan Holding Berhad
Pro forma consolidated statement of financial position as at 31 December 2016 and the notes thereon
(cont'd)

5. Effects on the pro forma consolidated statement of financial position (cont'd)

5.2 Proposed Scheme (cont'd)

5.2.5 Other reserves

	RM'000
As at 31 December 2016	
- Capital redemption reserves	24,908
- Foreign currency translation reserve	1,918,842
Total other reserves	1,943,750
Effect of implementation of CA 2016	(24,908)
Pro Forma I	1,918,842

5.2.6 Retained earnings

	RM'000
As at 31 December 2016	3,981,743
Effects of Proposed Scheme:	
- Utilisation of proceeds from the IPO	
(i) Estimated listing expenses	(152,864)
Pro Forma I	3,828,879

12.6 DIVIDEND POLICY

We propose to pay dividends out of cash generated from our operations after setting aside the necessary funding for working capital and maintenance capital expenditure requirements. As part of this policy, we aim to pay dividends in the amount equal to approximately 50% of our net profits of every fiscal year on a consolidated basis after taking into account working capital and maintenance capital expenditure requirements. To this end, considering our financial condition, capital expenditure for the purposes of capacity expansion and major changes in market conditions, including potential mergers and acquisitions, our Board may amend or create exceptions to the dividend policy with respect to the relevant period.

Despite the above, the declaration of dividends is subject to the discretion of our Board and our Company's compliance with the requirements under Sections 131 and 132 of the Act. It is our Board's intention to pay dividends to our shareholders in the future to allow them to participate in our profits and we will obtain our shareholders' approval for the declaration of any final dividend for a particular year. However, our ability to pay dividends or make other distributions to our shareholders will depend upon a number of factors, including our earnings, distributable reserves, capital requirements, financial condition, expected financial performance and other factors considered relevant by our Board.

Investors should note that this dividend policy merely describes our present intention and shall not constitute legally binding statements in respect of our future dividends which are subject to modification at our Board's discretion.

As we are a holding company, our income, and therefore our ability to pay dividends, is dependent upon the dividends and other distributions that we receive from our subsidiaries and associates. The payment of dividends or other distributions by our subsidiaries and associates will depend upon their distributable profits, operating results, financial condition, capital expenditure plans and other factors that their respective boards of directors deem relevant. Dividend may only be paid out of distributable reserves. In addition, covenants in loan agreements, if any, for our subsidiaries and associates may limit their ability to declare or pay cash dividends.

No inference should be made from any of the foregoing statements as to our actual future profitability or our ability to pay dividends in the future.

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The Board of Directors
Lotte Chemical Titan Holding Berhad
6th Floor, Bangunan Malaysian Re
No. 17, Lorong Dungun
Damansara Heights
50490 Kuala Lumpur

Dear Sirs

Reporting Accountants' opinion on the financial statements contained in the accountants' report of Lotte Chemical Titan Holding Berhad ("the Company")

We have audited the financial statements of Lotte Chemical Titan Holding Berhad and its subsidiaries ("the Group"), which comprise the statements of financial position as at 31 December 2016, 31 December 2015 and 31 December 2014 of the Group, and the statements of comprehensive income, statements of changes in equity and statements of cash flows of the Group for the years then ended, and notes to the financial statements, including a summary of significant accounting policies, as set out on pages 4 to 84.

In our opinion, the accompanying financial statements give a true and fair view of the financial position of the Group as at 31 December 2016, 31 December 2015 and 31 December 2014 and of its financial performance and its cash flows for the years then ended in accordance with Malaysian Financial Reporting Standards and International Financial Reporting Standards.

Basis for opinion

We conducted our audit in accordance with approved standards on auditing in Malaysia and International Standards on Auditing. Our responsibilities under those standards are further described in the *Auditors' responsibilities for the audit of the financial statements* section of our report. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Independence and other ethical responsibilities

We are independent of the Group in accordance with the By-Laws (on Professional Ethics, Conduct and Practice) of the Malaysian Institute of Accountants ("By-Laws") and the International Ethics Standards Board for Accountants' Code of Ethics for Professional Accountants ("IESBA Code"), and we have fulfilled our other ethical responsibilities in accordance with the By-Laws and the IESBA Code.

Lotte Chemical Titan Holding Berhad
(Incorporated in Malaysia)

Responsibilities of the directors for the financial statements

The directors of the Company are responsible for the preparation of financial statements of the Group that give a true and fair view in accordance with Malaysian Financial Reporting Standards and International Financial Reporting Standards. The directors are also responsible for such internal control as the directors determine is necessary to enable the preparation of financial statements of the Group that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements of the Group, the directors are responsible for assessing the Group's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the directors either intend to liquidate the Group or to cease operations, or have no realistic alternative but to do so.

Reporting Accountants' responsibilities for the audit of the financial statements

Our objectives are to obtain reasonable assurance about whether the financial statements of the Group as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with approved standards on auditing in Malaysia and International Standards on Auditing will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with approved standards on auditing in Malaysia and International Standards on Auditing, we exercise professional judgement and maintain professional scepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements of the Group, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's internal control.

- Evaluate the appropriateness of accounting policies used and the reasonableness of

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Lotte Chemical Titan Holding Berhad
(Incorporated in Malaysia)

Reporting Accountants' responsibilities for the audit of the financial statements (cont'd)

- Conclude on the appropriateness of the directors' use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditors' report to the related disclosures in the financial statements of the Group or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditors' report. However, future events or conditions may cause the Group to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements of the Group, including the disclosures, and whether the financial statements of the Group represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the financial statements of the Group. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with the directors regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Other matters

This report has been prepared solely to comply with the Prospectus Guidelines - Equity issued by the Securities Commission Malaysia and for inclusion in the prospectus of Lotte Chemical Titan Holding Berhad in connection with the listing of and quotation for the entire enlarged issued share capital of Lotte Chemical Titan Holding Berhad on the Main Market of Bursa Malaysia Securities Berhad and should not be relied upon for any other purposes. We do not assume responsibility to any other person for the content of this report.

Ernst & Young
AF 0039
Chartered Accountants

Lee Ming Li
2983/03/18(J)
Chartered Accountant

Johor Bahru, Malaysia
Date: 31 March 2017

Building a better working world

Lotte Chemical Titan Holding Berhad
(Incorporated in Malaysia)

Consolidated statements of comprehensive income
For the financial years ended 31 December 2016, 2015 and 2014

	Note	2016 RM'000	2015 RM'000	2014 RM'000
Revenue	4	8,136,628	8,147,847	8,611,229
Cost of goods sold		(6,154,673)	(6,828,703)	(8,375,064)
Gross profit		1,981,955	1,319,144	236,165
Other income		13,442	27,011	17,239
Distribution expenses		(102,193)	(107,087)	(104,754)
Administrative expenses		(87,770)	(87,009)	(73,823)
Foreign exchange differences		(21,126)	(84,731)	(1,233)
Fair value changes on derivatives		(5,418)	28,143	2,398
Other expenses		(56,161)	(21,694)	(18,139)
Profit from operations		1,722,729	1,073,777	57,853
Finance income		7,855	3,835	1,796
Finance costs	5	(15,076)	(22,883)	(41,074)
Net finance costs		(7,221)	(19,048)	(39,278)
Share of results of associates		(5,314)	(4,552)	(770)
Profit before tax	6	1,710,194	1,050,177	17,805
Income tax	9	(394,114)	(436,108)	(38,020)
Net profit/(loss) for the year		1,316,080	614,069	(20,215)
Other comprehensive income, net of tax				
Item that will not be reclassified subsequently to profit or loss:				
Remeasurement of defined benefit obligation		(1,405)	910	(923)
Item that may be reclassified subsequently to profit or loss:				
Foreign currency translation differences		404,728	1,106,944	273,063
		403,323	1,107,854	272,140
Total comprehensive income for the year		1,719,403	1,721,923	251,925

Lotte Chemical Titan Holding Berhad
(Incorporated in Malaysia)

Consolidated statements of comprehensive income
For the financial years ended 31 December 2016, 2015 and 2014
(cont'd)

		2016 RM'000	2015 RM'000	2014 RM'000
Net profit/(loss) for the year attributable to:				
Owner of the Company		1,315,386	613,211	(19,198)
Non-controlling interests		694	858	(1,017)
		1,316,080	614,069	(20,215)
Total comprehensive income for the year attributable to:				
Owner of the Company		1,718,184	1,719,360	252,453
Non-controlling interests		1,219	2,563	(528)
		1,719,403	1,721,923	251,925
Basic and diluted earnings/(loss) per ordinary share (sen)	10	76.13	35.49	(1.11)

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Lotte Chemical Titan Holding Berhad
(Incorporated in Malaysia)

Consolidated statements of financial position
As at 31 December 2016, 2015 and 2014

	Note	2016 RM'000	2015 RM'000	2014 RM'000
Assets				
Non-current assets				
Property, plant and equipment	11	4,378,823	3,596,368	3,249,773
Prepaid lease payments	12	36,278	36,990	30,997
Investments in associates	13	1,552,117	12,913	17,468
Deferred tax assets	14	160	121,075	463,475
Derivative financial instruments	24	11,369	-	-
		5,978,747	3,767,346	3,761,713
Current assets				
Inventories	15	1,147,072	1,187,285	1,264,355
Trade and other receivables	16	1,143,346	853,912	816,880
Tax recoverable		8,805	-	-
Prepayments		21,008	17,497	15,562
Derivative financial instruments	24	1,169	-	-
Cash and bank balances	17	1,040,344	1,511,001	184,001
		3,361,744	3,569,695	2,280,798
Total assets		9,340,491	7,337,041	6,042,511
Equity and liabilities				
Capital and reserves				
Share capital	18	1,727,792	1,727,792	1,727,792
Share premium	18	294,113	294,113	294,113
Other reserves	19	1,943,750	1,539,547	434,308
Retained earnings		3,981,743	2,660,402	2,147,477
Total equity attributable to owner of the Company		7,947,398	6,221,854	4,603,690
Non-controlling interests		22,022	10,790	8,227
		7,969,420	6,232,644	4,611,917

Building a better working world

Lotte Chemical Titan Holding Berhad
(Incorporated in Malaysia)

Consolidated statements of financial position
As at 31 December 2016, 2015 and 2014
(cont'd)

	Note	2016 RM'000	2015 RM'000	2014 RM'000
Non-current liabilities				
Loans and borrowings	20	-	72,206	116,716
Provision	22	325,919	274,998	290,206
Deferred tax liabilities	14	364,440	69,482	43,025
Defined benefit obligation	25	14,967	9,950	8,562
		705,326	426,636	458,509
Current liabilities				
Loans and borrowings	20	75,365	71,347	302,161
Trade and other payables	21	590,182	605,509	642,006
Other financial liabilities	23	198	248	250
Derivative financial instruments	24	-	657	27,668
		665,745	677,761	972,085
Total liabilities		1,371,071	1,104,397	1,430,594
Total equity and liabilities		9,340,491	7,337,041	6,042,511

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Lotte Chemical Titan Holding Berhad
(Incorporated in Malaysia)

Consolidated statements of changes in equity
For the financial years ended 31 December 2016, 2015 and 2014

		<---------- Attributable to owners of the Company ---------->							
		<---------- Non-distributable reserves ---------->				Distributable			
	Note	Share capital RM'000	Share premium RM'000	Capital redemption reserves RM'000	Foreign currency translation reserve RM'000	Retained earnings RM'000	Attributable to owners of the Company RM'000	Non-controlling interest RM'000	Total RM'000
At 1 January 2014		1,727,792	294,113	24,908	136,826	2,167,598	4,351,237	8,755	4,359,992
Net loss for the year		-	-	-	-	(19,198)	(19,198)	(1,017)	(20,215)
Other comprehensive income/(loss)		-	-	-	272,574	(923)	271,651	489	272,140
Total comprehensive income for the year		-	-	-	272,574	(20,121)	252,453	(528)	251,925
At 31 December 2014		1,727,792	294,113	24,908	409,400	2,147,477	4,603,690	8,227	4,611,917
At 1 January 2015		1,727,792	294,113	24,908	409,400	2,147,477	4,603,690	8,227	4,611,917
Net profit for the year		-	-	-	-	613,211	613,211	858	614,069
Other comprehensive income		-	-	-	1,105,239	910	1,106,149	1,705	1,107,854
Total comprehensive income for the year		-	-	-	1,105,239	614,121	1,719,360	2,563	1,721,923
Dividends	31	-	-	-	-	(101,196)	(101,196)	-	(101,196)
At 31 December 2015		1,727,792	294,113	24,908	1,514,639	2,660,402	6,221,854	10,790	6,232,644

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Lotte Chemical Titan Holding Berhad
(Incorporated in Malaysia)

Consolidated statements of changes in equity
For the financial years ended 31 December 2016, 2015 and 2014
(cont'd)

	<---------- Attributable to owners of the Company ---------->							
	<---- Non-distributable reserves ---->				Distributable			
	Share capital RM'000	Share premium RM'000	Capital redemption reserves RM'000	Foreign currency translation reserve RM'000	Retained earnings RM'000	Attributable to owners of the Company RM'000	Non-controlling interest RM'000	Total RM'000
At 1 January 2016	1,727,792	294,113	24,908	1,514,639	2,660,402	6,221,854	10,790	6,232,644
Net profit for the year	-	-	-	-	1,315,386	1,315,386	694	1,316,080
Other comprehensive income	-	-	-	404,203	(1,405)	402,798	525	403,323
Total comprehensive income for the year	-	-	-	404,203	1,313,981	1,718,184	1,219	1,719,403
Disposal of shares in subsidiary without loss of control	-	-	-	-	7,360	7,360	10,013	17,373
At 31 December 2016	1,727,792	294,113	24,908	1,918,842	3,981,743	7,947,398	22,022	7,969,420

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Lotte Chemical Titan Holding Berhad
(Incorporated in Malaysia)

Consolidated statements of cash flows
For the financial years ended 31 December 2016, 2015 and 2014

	2016 RM'000	2015 RM'000	2014 RM'000
Cash flows from operating activities			
Profit before tax	1,710,194	1,050,177	17,805
Adjustments for:-			
Depreciation of property, plant and equipment	398,363	420,959	338,996
Finance costs	15,076	22,883	41,074
Property, plant and equipment written off	49,171	11,136	13,079
(Reversal of write-down)/Write-down of inventories to net realisable value	(3,630)	(3,488)	2,827
Expenses recognised in respect of defined benefit plan	2,662	1,940	1,842
Inventories written off	481	12	1,788
(Reversal of)/provision for impairment loss on:			
- Trade receivables	(221)	(320)	1,457
- Other receivables	67	-	(146)
Amortisation of prepaid land lease payments	2,147	1,984	1,231
Share of results of associates	5,314	4,552	770
Bad debts written off	-	-	242
Bad debts recovered	(11)	-	(26)
(Gain)/Loss on disposal of property, plant and equipment	(11)	(976)	57
Finance income	(7,855)	(3,835)	(1,796)
Fair value changes in derivatives	5,418	(28,143)	(2,398)
Unrealised loss/(gain) on foreign exchange	26,528	29,734	(7,060)
Operating profit before working capital changes	2,203,693	1,506,615	409,742

Lotte Chemical Titan Holding Berhad
(Incorporated in Malaysia)

Consolidated statements of cash flows
For the financial years ended 31 December 2016, 2015 and 2014
(cont'd)

	2016 RM'000	2015 RM'000	2014 RM'000
Change in inventories	21,650	258,167	128,418
Change in trade and other receivables	(277,911)	156,407	131,220
Change in trade and other payables	41,247	(100,527)	(243,327)
Cash generated from operations	1,988,679	1,820,662	426,053
Payments under defined benefit plan	(403)	(393)	(672)
Finance costs paid	(4,738)	(7,286)	(15,276)
Income tax paid	(14,738)	(9,281)	(1,044)
Net cash generated from operating activities	1,968,800	1,803,702	409,061
Cash flows from investing activities			
Finance income received	7,855	3,835	1,796
Proceeds from disposal of property, plant and equipment	11	1,213	100
Repayment from/(Advances to) related company	-	11,488	(11,488)
Acquisition of property, plant and equipment	(1,001,013)	(157,608)	(154,482)
Investment in associate	(1,388,683)	-	-
Proceeds from disposal of shares in subsidiary	17,373	-	-
Acquisition of long term financial instruments	(17,530)	-	-
Proceed from disposal of financial instruments	14	-	-
Prepaid lease payments made	-	(890)	(20,625)
Net cash used in investing activities	(2,381,973)	(141,962)	(184,699)

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Lotte Chemical Titan Holding Berhad
(Incorporated in Malaysia)

Consolidated statements of cash flows
For the financial years ended 31 December 2016, 2015 and 2014
(cont'd)

	2016 RM'000	2015 RM'000	2014 RM'000
Cash flows from financing activities			
Drawdown of term loan	-	-	157,925
Interest paid on long-term borrowings	(2,016)	(6,353)	(18,071)
Net repayments of short-term borrowings	-	(189,228)	(123,843)
Repayments of long-term borrowings	(68,158)	(171,685)	(246,657)
Dividend paid	-	(101,196)	-
Net cash used in financing activities	(70,174)	(468,462)	(230,646)
Net (decrease)/increase in cash and cash equivalents	(483,347)	1,193,278	(6,284)
Effect of exchange rate changes on the balance of cash held in foreign currencies	12,690	133,722	14,474
Cash and cash equivalents at beginning of year	1,511,001	184,001	175,811
Cash and cash equivalents at end of year	1,040,344	1,511,001	184,001