

MARKET OUTLOOK

SK innovation analyzes the business market environment including potential fluctuations in a comprehensive way, as well as preparing a systematic response method to meet external changes to secure fundamental competitiveness.

Petroleum Production Business

Major market trend

Massive supply of unconventional oil and gas from U.S. has brought rapid changes in E&P industry. On top of that, growing global energy demand and U.S tax reform have induced bigger investments in the unconventional assets. Consequently, the market portfolio is currently under active modification in pursuit of improving the profitability.

Oil price trend

After the price of Dubai crude oil reached USD 115 per barrel in June 2014, there was a continuous fall in price until it became USD 26 per barrel in January 2016. As of December 2018, the average price per barrel is now hovering around USD 57.

Battery Business

Business characteristics

The medium-large battery business sector is where we develop, produce and sell high-storage lithium-ion batteries for electric cars and ESS (Energy Storage System). Automobile manufacturers are the main buyers of electric car batteries. Business transactions occur in contracts, initially to agree on a large quantity which is gradually supplied over a long period of time. Technology, product safety, cost competitiveness and stable supply are important factors in the automobile battery business. ESS is in the spotlight as technology for renewable energy as it stores surplus electricity production for future use, to solve the imbalance in supply and demand. Product safety and efficiency are crucial standards for ESS.

Market situation

Electric car batteries and ESS are anticipated to drive future growth with the spread of global environment-friendly products and renewable energy trends. As technology and economic efficiency of electric cars improve, major global automobile OEMs are enhancing their electric car lineup and investment

which is transforming the global automobile market into a new era of electric cars. As electric cars become more popular, the electric car battery market will continue to grow rapidly. The ESS market is also forecasted for continuous growth with the increasing demand for renewable energy and energy storage. Demand for automobile batteries is closely related to the demand for electric cars. Currently, the electric car market is influenced by environmental regulations and policies to promote electric cars but the industry reliance on regulation will continue to drop with technological advances and improved economic efficiency.

Materials Business

Market situation

LiBS (Lithium-ion Battery Separator) is the core material in lithium-ion batteries. It blocks direct contact of anode and cathode and provides a pathway for lithium-ion. It continues to develop with the growth of the battery market. The FCW (Flexible Cover Window) is a core material that substitutes glass on flexible displays like foldable phones and is composed of polyimide (PI) and hard-coat. We anticipate it will be the rapid growth force for the quickly changing display market which is pursuing changes in form factors.

Chemicals Business

Basic petroleum business trend

The basic petroleum business is a basic materials operation that uses naphtha and other feedstocks to produce olefin products such as ethylene and propylene as well as aromatics such as benzene, toluene and xylene. These products are used to create petrochemical products like synthetic plastics, synthetic rubber and synthetic fiber. In addition, the basic petroleum business is a facility-based industry which requires large-scale investment in equipment. Initial investment cost is high and first mover advantage in technology is strong which results in a high

entrance barrier but the industry fluctuates regularly depending on the world economy and global supply conditions. Since 2009, the petrochemical industry has bounced back due to China's economic stimulus policy but global uncertainty has grown with new facilities built in China and the Middle East, financial crisis in the Eurozone and the delay in the recovery of the global economy. Furthermore, we forecast that the spread of non-traditional, low-cost resources such as shale gas and coal will act as the main variables in market fluctuations.

Chemical materials business trend

The chemical materials business provides chemical products to a wide range of industries including automobiles, electronics, construction, pharmaceuticals and clothing. The industry profitability is sensitive to changes in oil price and economic fluctuations of industries. The sector is especially closely connected to the economic growth in China since the demand in China is extremely high. Recently, we have also been expanding into emerging markets like South America, Southeast Asia and India. In the case of general petrochemical products, price is the main differentiating factor. In order to secure competitiveness, it is necessary to achieve economies of scale and cut costs through business efficiency. Furthermore, as it is becoming more important to differentiate products by adding value based on technology, technology to design and produce is highlighted as a core competition factor. The high-functional ethylene acrylic acid (EAA) and poly vinylidene chloride (PVDC) which are the core materials in multi-layer packaging film are forecasted for continued growth as the markets have high barriers to entry and demand from emerging markets like China will develop.

Petroleum Business

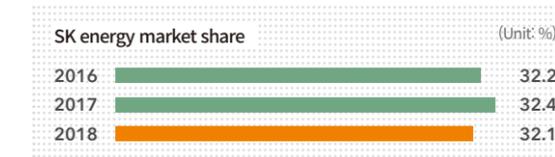
Business characteristics

The petroleum business is basically composed of a value chain from crude oil import, production, transportation and sales. Crude oil takes up the biggest cost. Since our entire supply relies on imports, business performance heavily depends on the export policies of oil-producing countries in the Middle East and the exchange rates. The distribution channel is largely made of wholesale and retail. Wholesale points to direct buyers and middle buyers like service stations. Retail signifies sales to general consumers in service stations or charging stations.

Consumer trend in petroleum products

The aggregate domestic demand for major petroleum products in December 2018 grew 0.2% year on year. Regarding transportation fuel, demand for diesel dropped year on year and demand for petroleum and aviation fuel increased year on year.

Domestic market share in petroleum market¹⁾



Dubai Crude price trend²⁾



1) Based on domestic sweet crude oil sales from Korea National Oil Corporation's oil information system

2) Based on Platts official price

Lubricants Business

Characteristics of base oil business

The Group III base oil is mainly used in manufacturing automobile engines and lubricants for transmissions. In major markets such as Europe, North America, Japan and China, strengthened emissions regulation standards and rapid improvement in engine technology has resulted in a higher demand for premium base oil. Fuel efficiency regulations are becoming stricter as advanced countries announce regulations that are more than 20% stricter in conditions from 2015 to 2020 as well as emerging nations also continuing to strengthen relevant policies. In response, major global automobile manufacturers are developing various technologies such as the turbo and hybrid engines. These engines require high-quality lubricants to maintain stable performance which is leading to the gradual increase in usage of premium base oils like Group III.

Characteristics of lubricants business

The lubricants business can be divided into B2B (Business to Business) and B2C (Business to Customer) based on distribution channels. Major clients in the B2B sector are automobile manufacturers that purchase either Factory Fill, fuel for manufacturing facilities or direct car center agencies that purchase Service Fill. In case of the B2C market, not only brand awareness but product handling in the distribution channel; agent, store and car center are crucial. Industrial lubricants can be categorized into B2B and B2C markets. Major B2B consumers are industries, construction and machinery companies who use the product to operate and maintain industrial equipment. Main B2C consumers are drivers of heavy machinery and the product is used for oil brake equipment like excavators. Shipping companies are the major buyers of transportation lubricants and relationships with port companies and refueling companies are also important in securing the market.