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Certain information and statistics presented in this Industry Overview have been based on or derived from an industry report prepared by CMAI (Shanghai) Limited, an industry consultant ("CMAI") dated September 6, 2012 (the "CMAI Report"). The CMAI Report is based on its in-house database, independent third party reports, publicly available data from government or industry publications and data provided by us. CMAI has advised that (i) certain information in its database is derived from estimates by public and industry sources; (ii) where necessary, CMAI contacts companies operating in the industry to gather and synthesize information about markets, prices and other relevant information; (iii) the information in the database of other petrochemicals data collection agencies or other sources may differ from the information in CMAI's database; (iv) information contained in the CMAI Report is based on data available at the time of data collection and may be subject to change from time to time, where such changes may not be known to CMAI; and (v) forecasts, forward looking statements, calculations based on assumptions and other public sources are inherently uncertain because of events or combinations of events that cannot reasonably be foreseen by CMAI. The information contained in the CMAI Report has been obtained from sources believed by CMAI to be reliable, certain information from government or industry publications is unavoidably subject to assumptions and estimates made by third parties and such information has not been independently verified by CMAI. The information extracted from the CMAI Report reflects an estimate of the market conditions based on CMAI's research and analysis at the time of preparation of the CMAI Report. The information extracted from the CMAI Report should not be viewed as a basis for investments provided by CMAI and references to the CMAI Report should not be considered as CMAI's opinion as to the value of any security or the advisability of investing in our Company. In no event will CMAI be liable for indirect, special, punitive or consequential damages of any kind or nature whatsoever, suffered by the other party.

GLOBAL OIL REFINING AND PETROCHEMICALS INDUSTRY OVERVIEW

Global Oil Refining Market Overview

Oil refining, together with production of petrochemicals, is generally considered as the downstream component of the petroleum industry. It is a process where crude oil is processed and refined into more useful petroleum products, which can be grouped into three categories: (i) light distillates, including liquefied petroleum gas, gasoline and naphtha; (ii) middle distillates, including kerosene and diesel; and (iii) heavy distillates and residuum, including heavy fuel oil, lubricating oils, wax and asphalt. The global refining sector has seen positive trends recently supported by global oil demand and economic growth, led in particular

by Asia. CMAI estimates that global refining capacity amounted to 4.6 billion tons in 2011, and is expected to increase to an average of 5.4 billion tons per year by 2020.

Global Petrochemicals Market Overview

Petrochemicals are further downstream in the value chain of the petroleum industry than refined oil products, as feedstock used in the production of petrochemicals is predominantly based on naphtha, a distillation product from the oil refining process. Besides naphtha, natural gas is also widely used as an alternative feedstock, especially in gas rich countries and regions, such as the Middle East, for petrochemicals production. Petrochemical products can broadly be classified into two categories (i) olefins, including ethylene and propylene, and (ii) aromatics, including benzene, toluene and xylene isomers, which can be further processed to manufacture thousands of downstream petrochemical products used in daily life. The petrochemicals industry is a global industry with revenues of approximately US$3.7 trillion in 2011 as estimated by CMAI.

According to CMAI, the petrochemicals industry experiences cycles that can coincide or slightly lag behind the economic cycles of regional or global economies. The cycles in the petrochemicals industry are characterized by periods of tight production supply, when demand for petrochemicals is strong in the booming phase of an economic cycle, leading to high operating rates and higher margins for petrochemicals producers. The period of high demand and higher margins is typically followed by periods of increased investment in capacity additions, which may result in an oversupply of petrochemicals, leading to reduced operating rates and profit margins, before changes in economic conditions prompt the next cycle.

Global Ethylene Market Overview

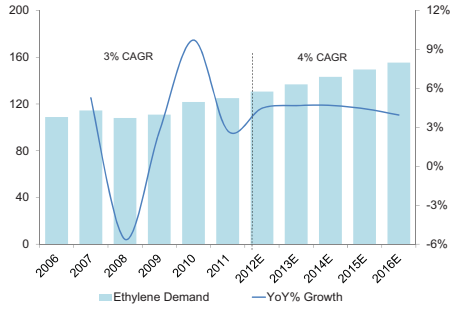
Ethylene is a key petrochemicals building block that is used to produce many midstream and downstream petrochemical products, such as polyethylene, PVC, styrene and ethylene glycol. These chemicals are, in turn, essential materials for the manufacture of products used in daily life including synthetic rubbers (plastics), synthetic fibers, synthetic resins, textiles, chemical fertilizers, agricultural plastic films and insecticides. Given the importance of ethylene in the petrochemicals value chain and the technology complexity required for its production, ethylene capacity is viewed as a strong indicator for assessing the level of development of a country's petrochemicals industry.

In 2008, global ethylene demand contracted by 5.6%, partly due to the global financial crisis, but recovered to pre-crisis levels in 2010, as estimated by CMAI. CMAI estimates that global ethylene demand grew by 3.0% during 2011. Between 2012 and 2016, CMAI expects further demand growth supported by the continued economic recovery. During the same period, CMAI expects China and the Middle East to continue to be the largest drivers of global ethylene demand growth, while the Indian subcontinent, Southeast Asia and Africa are also expected by CMAI to achieve higher growth rates than the global average.

On the supply side, significant new ethylene cracker capacity came on line in the Middle East and China between 2008 and 2011, according to CMAI. This increase in ethylene supply, however, has yet to affect the olefins markets due to better than expected Asian demand growth and delays in the actual production time on a number of new ethylene

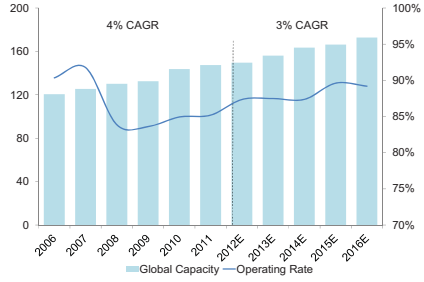
production facilities. Nevertheless, the effect of the increase in capacity is expected to permeate the market in 2012, resulting in significant increases in the supply of ethylene, as estimated by CMAI. However, CMAI also expects the demand for ethylene will grow and catch up to the increase in supply by 2013. As a result, CMAI expects ethylene producers to experience improved operating rates between 2014 and 2015.

Global Ethylene Demand
(in million metric tons)



Source: CMAI

Global Ethylene Capacity
(in million metric tons)



Source: CMAI

Ethylene complexes consist of multiple processing units, including an ethylene cracker, storage and tanks, utilities systems and infrastructure such as roads, buildings and laboratories that turn feedstock into olefins and further into other chemicals, such as polyolefins and other chemical derivatives. CMAI estimates that the cost of a modern, world-scale ethylene complex is typically in the range of US$3.0 billion to US$6.0 billion, depending on the configuration and whether the project is brown-field or green-field. An ethylene cracker is a processing unit that takes feedstock, such as naphtha, and converts it into olefins (ethylene and propylene) and other by-products and is commonly viewed as the most technically complicated process unit in the whole ethylene complex. An ethylene cracker comprises an ethylene furnace and other equipment such as compressors, pumps, vessels, distillation towers, heat exchangers, pipelines and peripheral/safety/control systems. The ethylene furnace is the core unit of an ethylene cracker and typically accounts for approximately 30.0% of its cost. The investment cost for a one Mtpa ethylene cracker is typically in the range of US$800 million to US$900 million, as estimated by CMAI.

Price of Products

We believe that the market prices for the products produced by the facilities that we design and/or construct, such as ethylene, propylene, methanol and olefins, do not typically have any direct correlation to the level of demand for our services. The correlation between oil and gas and its downstream products' price cycles and EPC business activities is not strong in the markets in which we currently operate and expect to operate in the future, such as the PRC, Southeast Asia, the Middle East and Latin America, due primarily to the following reasons: (i) most of the countries in these regions are developing countries that, regardless of any price volatility, require a steady supply of resources to support their growing economies; (ii) some of these countries are also continuing to develop their petroleum downstream industry and expansion capital expenditure may not fluctuate in direct response to price changes in end products; and (iii) projects may take between three and five years from conception to implementation, and any short term volatility in product prices may not affect capital expenditure.

CHINA'S REFINING AND PETROCHEMICALS INDUSTRY OVERVIEW

According to Oxford Economics and Economist Intelligence Unit Limited, China's GDP and energy demand is expected to continue to grow from 2012 to 2020.

China's Oil Refining Market Overview

China's demand for refined oil products has experienced steady growth in the past decade, increasing from 175.0 Mtpa in 2000 to 377.0 Mtpa in 2011, representing a CAGR of 7.2%, as estimated by CMAI. The increase in demand for refined oil products has been driven principally by growth in transport fuels. Nevertheless, the proportion of China's energy demand attributable to transport fuels was only 7.7% in 2009, as compared to 28.6% in the United States, according to the U.S. Energy Information Administration, reflecting the fact that China's use of vehicles is still low in relation to its population size, where its number of vehicles per capita was 0.047 as of 2009, as compared to 0.802 in the United States, according to the World Bank.

China has been increasing its oil refining capacity and refined oil product supply to meet its growing demand. According to Sinodata Consulting, China's total oil refining capacity was 283.0 Mtpa in 2000, 395.0 Mtpa in 2005 and 542.0 Mtpa in 2011, representing a CAGR of 6.1% from 2000 to 2011, compared to a demand CAGR of 7.2% in the same period. During late 2008 and early 2009, there was a slowdown in the growth of demand due to the global financial crisis; however, CMAI expects demand for refined products to pick up in this decade with a CAGR of 3.6% during 2011-2021. Refining capacity is expected to increase from 542.0 Mtpa in 2011 to 940.0 million tons by 2021, representing a CAGR of 5.7%, as estimated by CMAI.

Sinopec and PetroChina are the two major PRC oil refining companies, supplying 43.2% and 33.3% of China's oil refining capacity in 2011, respectively, while CNOOC, Shaanxi Yanchang Petroleum (Group) Corp. Ltd. and Sinochem Group provided the remaining approximately 23.5% in aggregate of China's oil refining capacity in 2011, as estimated by CMAI.

China's Petrochemicals Market Overview

China is one of the largest petrochemicals markets in the world in terms of both production capacity and consumption, as estimated by CMAI. According to the China National Bureau of Statistics, China's petrochemicals sector was its third largest industry, behind textiles and machinery, in 2010.

The three key state-owned petrochemicals producers that dominate China's ethylene industry are Sinopec, PetroChina and CNOOC, accounting for 63.0%, 23.6% and 6.4% of China's ethylene production capacity in 2011, respectively, as estimated by CMAI. Sinopec is the largest domestic producer of petrochemicals, accounting for 63.0% of China's ethylene capacity in 2011 as estimated by CMAI.

China's Ethylene Market Overview

China's ethylene production capacity has been growing rapidly in recent years. From 2006 to 2011, China's ethylene production capacity increased by 75% from 8.9 million tons per year in 2006 to 15.6 million tons per year in 2011, as estimated by CMAI. Going forward, CMAI estimates that China's ethylene production capacity will grow from 15.6 million tons per

year in 2011 to 24.7 million tons per year by 2016, with an increase of approximately 9.1 million tons of annual ethylene production capacity.

Despite the rapid increase in ethylene production capacity between 2006 and 2011, China has not been able to achieve self-sufficiency in ethylene supply. As a result, ethylene and its derivatives are imported in significant quantities to fulfill China's petrochemicals demand. Between 2006 and 2011, China's self-sufficiency rate in ethylene was around 60.0% in each year. CMAI projects that China's ethylene self-sufficiency rate will remain at this level in the near future despite a significant number of projects being planned and built.

The top ten PRC ethylene producers in terms of 2011 production capacity are listed in the table below.

Top Ten PRC Ethylene Production Facilities in 2011 in Terms of Annual Capacity

Rank	Company	Average Annual Capacity	Share % of Total
		(in thousand metric tons)	
1	PetroChina Dushanzi[1][2]	1,220	7.80%
2	SECCO[1]	1,200	7.67%
3	Sinopec Maoming[1][3]	1,000	6.40%
4	Sinopec SABIC Tianjin Petrochemical Co., Ltd.[2]	1,000	6.40%
5	CSPC[1][4]	1,000	6.40%
6	Sinopec Zhenhai Refining and Chemical Company[3]	1,000	6.40%
7	Sinopec Qilu[1][3]	860	5.50%
8	Sinopec Shanghai[1][3]	850	5.44%
9	PetroChina Jilin[1][2]	850	5.44%
10	Sinopec Beijing Yanshan Co., Ltd.[1][3]	820	5.24%
	Total	9,800	62.68%

Source: *CMAI*

Notes:

(1) Denotes facilities where we participated in construction.
(2) Denotes facilities owned by PetroChina.
(3) Denotes facilities owned by Sinopec.
(4) Denotes facilities owned by CNOOC.

CHINA'S COAL-TO-CHEMICALS INDUSTRY OVERVIEW

China's Coal-to-Chemicals Market Overview

Coal-to-chemicals refers to the process of producing chemicals from coal. The major coal-to-chemicals processes utilized in China include coal-to-methanol, coal-to-olefins, coal-to-PVC, coke to benzene and coal-to-ammonia/urea. China has the world's second largest coal reserves behind the United States and is the largest coal producing country in the world, as estimated by CMAI. Given the abundance of coal resources in China, availability of low price coal-based feedstock, and improvements in coal-to-chemicals technology, the PRC government is encouraging the development of more coal-based chemical production in China to reduce dependence on petroleum, and to utilize coal resources in a more environmentally friendly manner. In 2011, coal consumed as a raw material in China's chemical industry accounted for only approximately 5.2% of the total coal consumption. However, with the large coal-to-chemicals projects being put into operation between 2012 and 2016, CMAI expects the percentage of coal consumption in China as chemical feedstock to increase.

China has been developing its coal-to-chemicals sector in the past, largely in the areas of coal-to-PVC, coal-to-aromatics and coal-to-ammonia/urea. More recently, the focus has been shifted to coal-to-methanol, MTO and MTP processes due to better cost efficiencies and greater demand for these chemicals. CMAI expects the capacity for coal-to-methanol, coal-to-ethylene and coal-to-propylene (CTP) in China to increase between 2012 and 2016 potentially by approximately 27,620kta. The coal-to-methanol conversion is an established technology with several industrial plants operating such conversion in China. While MTO and MTP technologies are still at an early stage, they have demonstrated good potential as viable chemical production processes.

China is projected to add another ten coal-to-olefins projects between 2012 and 2016, as estimated by CMAI. With these expansions, CMAI estimates that ethylene capacity from MTO projects will increase to 12.0% of total ethylene capacity in China by 2016, while propylene capacity, based on MTO and MTP projects, will increase to 20.0% of total propylene capacity in China by 2016.

On the other hand, the PRC government is also becoming cautious in approving new coal-to-chemicals project investments given the proliferation of small scale projects that do not justify their environmental impact. In the case of coal-to-olefins, the technology is also newly developed and there may be undiscovered risks. The PRC government has updated its policy on coal-to-chemicals investment approvals on March 23, 2011, restricting investments to specified large scale projects for the various coal derivative technologies—with a minimum scale of 500kta of olefins in the case of coal-to-olefins. Nevertheless, according to CMAI, the implementation of this new policy is not likely to have a large effect on the coal-to-chemicals industry in China. Although new projects with scales smaller than the minimum requirements stated in the new policy will not be approved and the total number of coal-to-chemicals projects in China will therefore be likely to be reduced, there should not be any material change due to new coal-to-chemicals policies as the estimated total coal-to-chemicals capacity expansion is not expected to change materially in the future, as we anticipate more large scale projects or increases in scale for some of the projects. In addition, as advised by our PRC legal adviser, the coal-to-chemicals project approvals that have been duly obtained from competent government authorities prior to March 23, 2011 will not be revoked by virtue of the implementation of the new policy (unless the project scope is modified or amended).

With respect to the impact of the new policy on the coal-to-chemicals EPC market, since the total planned coal-to-chemicals capacity expansion remains largely unchanged, the market size of the coal-to-chemicals EPC market in China is not expected to change. However, as it is expected that the total number of coal-to-chemicals projects will be reduced and the average scale will be increased, our Directors expect that the entry barrier for new coal-to-chemicals EPC service providers in China will be maintained. According to CMAI, there are 14 coal-to-methanol projects, ten coal-to-olefins projects and two coal-to-propylene projects being planned in China to commence construction between 2012 and 2016. More details regarding the projects being planned are listed in the table below. According to CMAI, all the projects listed in the table below are understood to have been reviewed and approved by the PRC government authorities and are expected to proceed, even taking into account the new policy implementation.

China Coal-to-Chemicals New Projects

Company	Location	Methanol Capacity (KTA)	Ethylene Capacity (KTA)	Propylene Capacity (KTA)	Project Commencement Timing
Baofeng Energy	Ningdong, Ningxia	1,800	300	300	2015
CPI/Total JV	Erdos, Inner Mongolia	2,400	400	400	2016
Donghua Energy	Ordos, Inner Mongolia	600	—	—	2013
Huating Coal Group	Gansu	600	—	200	2015
PuCheng Clean Energy	Pucheng, Shaanxi	1,800	300	380	Mid-2013
Qinghai Salt	Golmud, Qinghai	1,000	160	160	2014
Shaanxi Yanchang	Yan'an, Shaanxi	1,800	450	450	Mid-2014
Shanxi Tianhao Chemical	Xiaoyi, Shanxi	200	—	—	2014
Shenhua Ningmei	Ningdong, Ningxia	1,500	—	500	Mid-2014
Shenhua Xinjiang	Urumqi, Xinjiang	1,800	160	360	Mid-2016
Sinopec Zhijin	Zhijin, Guizhou	1,800	300	300	Q4-2014
Yankuang Guohong	Zoucheng, Shandong	1,800	300	300	Mid-2014
Yili Meidianhua	Yili, Xinjiang	1,800	300	300	2013
Yulin Energy & Chem.	Yulin, Shaanxi	1,800	300	300	Q2-2013
Total		20,700	2,970	3,950	

Source: CMAI

China's Coal-to-Chemicals Producers

China's coal-to-chemicals sector is more segmented than the oil refining and petrochemicals sectors, as there are more coal-to-chemicals producers in the market and where the top 15 coal-to-methanol producers in 2011 provide around 36.3% of the total methanol capacity in China, as estimated by CMAI. Key producers in the coal-to-chemicals sector are coal companies such as Shenhua Ningxia Coal Industry Group, Shenhua Baotou and Yankuang, power companies such as Datang International Power Generation Co., Ltd. and gas distributors such as ENN Energy Service Co., Ltd.

The following table lists the top 15 coal-to-methanol producers in China in 2011.

Top 15 Coal-to-Methanol Production Facilities in China in 2011

Rank	Company	Location	Total Methanol Capacity (2011)	Share % of Total Methanol Capacity
			(in thousand metric tons)	
1	Shenhua Ningxia Coal Industry Group	Ningdong, Ningxia	2,530	5.7%
2	Datang International Power Generation Co., Ltd.	Duolun, Inner Mongolia Hulunbeier, Inner Mongolia	1,880	4.3%
3	Shenhua Baotou Coal Chemical Co., Ltd.	Baotou, Inner Mongolia	1,800	4.1%
4	Yankuang Group	Zoucheng, Shangdong Yulin, Shaanxi Tengzhou, Shangdong Xiaoyi, Shanxi	1,670	3.8%
5	Shandong Jiutai	Erdos, Inner Mongolia Linyi, Shandong	1,250	2.8%
6	Puyang Longyu Chemical Co., Ltd.	Yong Cheng City, Henan	1,000	2.3%
7	Shanghai Coking & Chemical Corporation	Shanghai	950	2.2%
8	East Hope Group	Chongqing, Sichuan Hulunbeier, Inner Mongolia	700	1.6%
9	Donghua Energy	Ordos, Inner Mongolia	600	1.4%
10	ENN Energy Service Co., Ltd	Dalateqi, Inner Mongolia	600	1.4%
11	Gansu Huating	Huating, Gansu	600	1.4%
12	Shaanxi Weihe Coal	Weinan, Shaanxi	600	1.4%
13	Shaanxi Xianyang Chem. Ind. Co.	Xianyang, Shaanxi	600	1.4%
14	Shanxi Coking Corp.	Jiexiu, Shanxi Xiangfen, Shanxi Hongtong, Shanxi	600	1.4%
15	Shenmu Shaanxi	Shenmu, Shaanxi	600	1.4%
	Total Top 15 Coal-to-Methanol Production Facilities		15,980	36.3%
	Total China Methanol Capacity		44,024	100.0%

Source: CMAI

GLOBAL EPC MARKET

Introduction of EPC

An EPC service provider is generally in charge of all aspects of a construction project for an oil refinery or a petrochemicals or coal-to-chemicals facility, including the design and engineering, quality and budget control and construction schedule. The role of an EPC service provider is to facilitate integration of various elements and systems and to plan each phase of a project, including scheduling, material and equipment specifications, cost estimates and resources for post-sale technical support.

Activities covered during the EPC phases of a project typically include:

Engineering—This is where project requirements are reviewed and basic design work is completed and then submitted to the project owner for approval. Upon approval, detailed

designs that transform basic designs into actual construction and installation plans are produced. EPC service providers also facilitate the procurement of raw materials and equipment. Additional engineering drawings may also be developed for various disciplines and skill-sets such as piping layouts, foundations/civil works and instrumentation/electrical works.

Procurement—This is where, based on the specifications drawn up during the engineering phase of a project, the EPC service providers prepare a list of relevant suppliers, seek bids, evaluate bidders' proposals and closely monitor suppliers' manufacturing and delivery progress to ensure that all ordered raw materials and equipment are delivered on schedule and are ready for scheduled installation and construction.

Construction—Activities during this phase include site preparation, completing the foundations and equipment erection, and installing pipe-racks and piping, electrical equipment and instruments. This is where different equipment and parts of the project are connected together to function operationally as per the design intent. EPC service providers generally outsource the construction and installation work to construction sub-contractors, but are responsible for organizing and supervising the construction process to ensure quality and timely completion.

The activities of EPC service providers can vary by contract as required by the project owners. For instance, in engineering and procurement (EP) services, the service providers design and provide engineering services for the project, undertake the procurement of raw materials and equipment but allow the project owners or third parties to handle the construction of that project. In contrast, in procurement and construction management (PC) services, the service providers do not make decisions on design and selection of technology but rather act as the project managers by overseeing the implementation of the design, undertaking the procurement and monitoring and supervising the installation and construction of that project. In project management contracting (PMC) services, the service providers charge a fee for project management services but the project owners are responsible for the design and engineering and assume the cost of procurement and construction.

Global EPC Market Overview

Global Petrochemicals EPC Market

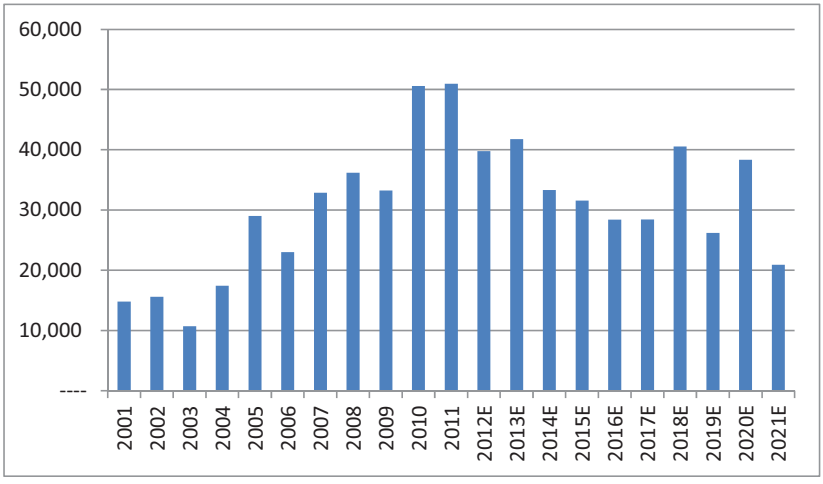
Overall, the general trend of the petrochemicals EPC industry follows the growth in supply (capacity) in the industry. As such, annual capacity additions are a good indicator of the demand of EPC services and therefore general EPC industry profitability.

The following figure shows historical global capacity additions for a basket of selected petrochemical products, indicating additions from 2001 to 2011 and estimated additions from 2012 to 2016 and hypothetical additions post-2016. Consistent with the last five years of EPC industry performance, new capacity additions generally increased from 2005 to 2008. In 2009, the industry was affected by the global financial crisis that reduced demand and caused a number of project owners to delay progress on a number of new investments. Demand for petrochemicals increased in late 2009 and, with the gradual recovery of the financial markets, many of the delayed petrochemicals projects continued to completion with strong capacity additions in 2010 and 2011. With the advent of such significant amounts of new capacity in

2010 and 2011, CMAI expects the consequential oversupply capacity will result in lower industry profitability and hence less incentive for new investment. CMAI expects a significant slowdown in new capacity additions in 2012 and reduced investment levels and supply additions until 2018, with a trough expected in 2016. Demand should then begin to catch up with supply, and the cycle will likely begin again with an upswing in new investments expected in the later part of the decade.

Global Capacity Additions for Selected Petrochemicals 2001-2021

(in thousand metric tons)



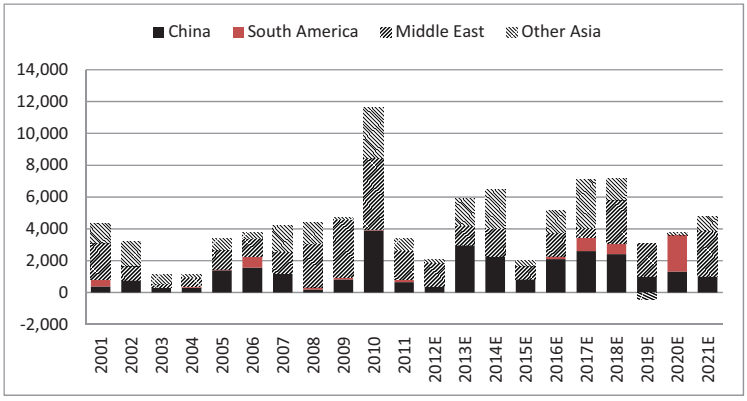
Source: CMAI.

Note: Selected petrochemicals include: methanol, ethanol, urea, ethylene, benzene, EDC/VCM, PVC, PTA, PET and polypropylene.

A summary of the designated regional capacity additions for ethylene production alone is shown in the following figure. While these trends follow the general petrochemicals cycle, the addition of ethylene capacity in 2010 was significant and resulted from completion of numerous new projects that were delayed. This surge in new ethylene capacity has resulted in a decrease in new investments that is evident in 2011 and is expected to continue in 2012 to 2015. CMAI expects ethylene industry profitability to begin to improve again in late 2012 and to begin to provide the incentive for new investments with an expected increase in new builds from 2016. CMAI estimates that the Middle East, with its strong feedstock position, is the dominant area for additional ethylene capacity, with China, with its strong demand for ethylene derivatives, also continuing to be significant.

Regional Capacity Additions for Ethylene 2001-2021

(in thousand metric tons)



Source: CMAI

CMAI estimates that projects that are currently being planned for or developed will add another 18.3 million tons of ethylene cracker production capacity globally from 2012 to 2016. Projects in the Middle East and China are expected to account for 11.5 million tons (with the Middle East contributing 6.7 million tons and China contributing 4.8 million tons), with the rest of the additions mainly in other parts of Asia. In China, up to 3.0 million tons of ethylene production capacity will be added between 2012 and 2016 from coal to ethylene, as estimated by CMAI (excluding a 1.3 million tons methanol-to-olefins plant that does not consume coal). Capital investments for new ethylene cracking facilities (excluding other associated facilities) during this period are estimated by CMAI to be between US$15.0 billion and US$16.0 billion, with the Middle East accounting for more than US$6.3 billion and China accounting for approximately US$3.0 billion.

In addition to the opportunities for constructing new plants, another area of opportunity for EPC service providers is renovation of existing petrochemicals plants. Every four to six years, existing ethylene facilities typically require significant renovation expenditures beyond general maintenance. CMAI estimates that based on a US$30.0 million expenditure for 300kta of ethylene capacity, and assuming the global economic cycle will follow the historical trend line of an eight year cycle, the renovation cost for ethylene facilities in North America and Western Europe from 2012 to 2016 would be averaged around US$740.0 million per year and for ethylene facilities in Asia and the Middle East would be approximately US$1.1 billion per year from 2012 to 2016.

Ethylene cracker capacity additions and estimated capital expenditures across different regions, excluding ethylene from coal-to-olefins, are summarized in the table below.

	Ethylene Cracker Capacity				Ethylene Cracker Investment Cost			
	New Capacity		Expansion		New Capacity		Expansion	
	2006-2011	2012-2016	2006-2011	2012-2016	2006-2011	2012-2016	2006-2011	2012-2016
	(in thousand metric tons)				*(in US$ millions)*			
Middle East	13,570	6,678	370	0	11,837	6,374	348	0
China	5,327	4,800	871	19	2,991	2,915	522	25
Southeast Asia	2,700	1,320	387	400	2,392	1,403	400	311
Northeast Asia excluding China	1,200	800	1,739	547	1,014	863	880	401
Central Europe	590	0	54	0	810	0	78	0
South America	333	0	117	0	211	0	146	0
Indian Subcontinent	857	2,670	280	0	478	1,570	170	0
North America	0	1,200	0	869	0	1,221	0	806
West Europe	0	0	342	0	0	0	321	0
CIS and Baltic States	300	420	50	80	411	535	74	106
Africa	0	460	60	0	0	596	82	0
Total	24,877	18,348	4,270	1,915	20,143	15,478	3,020	1,648

Source: *CMAI*
Note: *Capacities shown above do not include ethylene shutdowns in the US, Western Europe and Eastern Europe*

CHINA EPC MARKET

Key EPC Service Providers

Oil Refineries and Petrochemicals

There are no substantive regulatory barriers to entry into the petrochemicals EPC market, but a new entrant needs to obtain certain certificates from the relevant PRC authorities, which could be a lengthy process for a company with little experience in this area. In terms of other barriers to entry, with the presence of well-established local engineering companies in the petrochemicals EPC market in China and the need to obtain the necessary certification from the relevant PRC authorities, our Directors consider that it will be difficult for a new entrant to quickly gain credibility with the project owners.

In the 1990s, the "project owner contractor" model was commonly used in China, where the design and construction management were carried out solely by the project owners themselves. In the past ten years, with the rapid expansion and significant additions of capacity, there has been a clear trend of shifting from the project owner contractor model to the EPC model.

Before 1995, almost all ethylene units in China were imported, and international contractors and licensors were used, with limited involvement of domestic design institutions and construction companies. Starting from the early 1990s, the PRC government's focus on developing local petrochemicals plant design and research capabilities resulted in an increasing domestic involvement in the contractor sector, which led to an increase in the use of PRC engineering companies instead of international EPC services.

Based on the industry rankings completed by the China Exploration & Design Association, the top chemical EPC service providers in the PRC by 2011 contract revenue were the following organizations:

TOP CHEMICAL EPC SERVICE PROVIDERS IN THE PRC

Ranking of Chemical EPC Service Providers in 2011[1]	Ranking of All EPC Service Providers in 2011[2]	Company Name	2011 Contract Revenue[3]	Ranking of Chemical EPC Service Providers in 2010[1]	Ranking of All EPC Service Providers in 2010[2]	2010 Contract Revenue[3]
			(RMB in millions)			*(RMB in millions)*
1	1	Huanqiu[4]	24,517	1	1	24,490
2	6	Luoyang Petrochemical Engineering Corporation[5]	9,109	3	10	7,220
3	8	Sinopec Engineering Incorporation[5]	8,522	2	5	9,348
4	12	SSEC[5]	7,246	4	11	6,588
5	14	CNPC Engineering Design Co., Ltd.[4]	6,647	9	30	2,877
6	15	China Chengda Engineering Co., Ltd.	6,320	5	13	6,064
7	16	China Tianchen Engineering Corporation	5,302	7	17	4,509
8	17	Wison Engineering[6]	4,906	6	15	4,923
9	21	Wuhuan Engineering Co., Ltd.	3,989	8	27	3,263
10	22	Sinopec Ningbo Engineering Co., Ltd.[5]	3,860	10	36	2,135

Sources: China Exploration & Design Association and CMAI

Notes:

(1) Determined by CMAI based on data published by China Exploration & Design Association for EPC companies that service the PRC chemical sector, which includes, among others, the petrochemicals, oil refining and coal-to-chemicals industries.

(2) Ranking based on the total revenue of the top 150 EPC service providers in the PRC by China Exploration & Design Association, which include companies that service all industries, including but not limited to railway, power, cement and chemicals.

(3) Estimated by China Exploration & Design Association through a methodology consistently applied to all surveyed companies. Contract revenue estimations may not be consistent with IFRS revenue reported.

(4) Denotes an affiliate of PetroChina.

(5) Denotes an affiliate of Sinopec.

(6) Wison Engineering was the largest private sector (non-state-owned) chemical EPC service provider in the PRC in 2010 and 2011.

CMAI expects the engineering subsidiaries of PetroChina and Sinopec to continue to account for a significant share of the EPC work in China between 2011 and 2016, but that leading private sector EPC companies will also have an important role to play. CMAI believes that Wison Engineering's strong market position has evolved based on a combination of Wison Engineering's furnace technology, coupled with Wison Engineering's experience, ability to service clients' requirements, and successful track record that they believe provides a strong basis for its future business.

Coal-to-Chemicals

The following EPC companies in China, most of which are also major EPC service providers in the PRC refining and petrochemicals markets, are key EPC service providers in the PRC coal-to-chemicals market and the type of coal-to-chemicals projects that these service providers focus on are listed below:

Type of Coal-to-Chemicals Projects	Major EPC Service Providers
Coal-to-Methanol	China Tianchen Chemical Engineering Corporation Hualu Engineering & Technology Co., Ltd. Wuhuan Engineering Co., Ltd. Wison Engineering
Coal-to-Ammonia	Sinopec Ningbo Engineering Co., Ltd Wuhuan Engineering Co., Ltd.
MTO	Sinopec Luoyang Petrochemical Engineering Corporation Wison Engineering
MTP	Wuhuan Engineering Co., Ltd. Wison Engineering
Coal-to-Acetic Acid	Hualu Engineering & Technology Co., Ltd.

Source: CMAI

The engineering subsidiaries of Sinopec and PetroChina have been involved in fewer projects in the coal-to-chemicals EPC market, as compared to their involvement in the oil refineries and petrochemicals EPC markets. Principal EPC contractors in the coal-to-chemicals market are companies under the former Ministry of Chemical Industry (i.e. China Tianchen Chemical Engineering Corporation, Hualu Engineering & Technology Co., Ltd. and Wuhuan Engineering Co., Ltd.) and we are making a strong effort to penetrate this market with a focus on entry via technology development.

China's Oil Refining Market Size

Driven by China's rapid economic growth and expansion of the automotive industry, China's oil refining capacity increased significantly between 2005 and 2011, from 395.0 million tons per year in 2005 to 542.0 million tons per year in 2011 as estimated by CMAI, in order to meet the growth of demand in China. Currently, many oil refineries are in different stages of development and China's oil refining capacity is expected to grow from 542.0 million tons per year in 2011 to 760.0 million tons per year in 2016, to 940.0 million tons per year in 2021 and further to 990.0 million tons per year in 2026, as estimated by CMAI.

Oil refineries are capital-intensive. A single world-scale oil refinery of 200,000-barrels-per-day capacity may require up to US$7.0 billion in total investment. CMAI estimates the total investment costs in China for the oil refinery capacity expansions from 2012 to 2016 will be in the range of US$65.0 billion to US$80.0 billion, with an additional US$75.0 billion to US$85.0 billion of investment expected from 2016 to 2021, which investment cost represents capital expenditures for new refinery projects that are most likely to be built. The EPC of oil refineries is also highly complicated, requiring the participation of a large number of specialized contractors and companies involved in the different process units and off-site facilities.

China's Ethylene Market Size

Despite the rapid increase in ethylene capacity between 2006 and 2011, China has not been able to achieve self-sufficiency in ethylene supply, and ethylene and its derivatives are imported in significant quantities to fulfill China's petrochemicals demand. CMAI estimates that between 2006 and 2011, China's self-sufficiency rate in ethylene was approximately 59.0% on average. CMAI expects that China will remain at this level of ethylene self-sufficiency, averaging around 60.0%, in the near future, despite additional new projects being planned and built.

CMAI estimates that China's ethylene capacity will grow from 15.6 million tons per year in 2011 to 24.7 million tons per year by 2016, an increase of approximately 9.1 million tons per year of ethylene capacity among which 4.8 million tons are from ethylene cracker, 1.3 million tons from MTO and 3.0 million tons are from coal-to-ethylene additions. CMAI also estimates that China will add 60-75 new ethylene cracker furnaces between 2012 and 2016. The table below lists China's announced ethylene capacity expansion projects for the period between 2012 and 2016:

China Ethylene Capacity Expansions (2012-2016)

Company	Location	Capacity Expansion					
		2012	2013	2014	2015	2016	Total
		(in thousand metric tons)					
Baofeng Energy	Ningdong, Ningxia	—	—	—	300	—	300
BASF-YPC Co., Ltd.	Nanjing, Jiangsu	19	—	—	—	—	19
CSPC	Huizhou, Guangdong	—	—	—	—	1,000	1,000
CPI/Total JV	Erdos, Inner Mongolia	—	—	—	—	400	400
PetroChina Daqing Petrochemical Co., Ltd	Daqing, Heilongjiang	—	600	—	—	—	600
PetroChina Fushun Petrochemical Co., Ltd.	Fushun, Liaoning	267	533	—	—	—	800
Jiutai Energy (IM)	Inner Mongolia	—	—	100	200	—	300
Wison Nanjing	Nanjing, Jiangsu	—	100	—	—	—	100
Ningbo Heyuan	Ningbo, Zhejiang	—	—	300	—	—	300
PuCheng Clean Energy Chemical Co., Ltd.	Pucheng, Shaanxi	—	150	150	—	—	300
Qinghai Salt	Golmud, Qinghai	—	—	160	—	—	160
Shaanxi Yanchang Petroleum (Group) Corp. Ltd.	Yan'an, Shaanxi	—	—	225	225	—	450
Sinopec Shanghai	Jinshan, Shanghai	—	—	300	—	—	300
Shanxi Coking Corp.	Hongtong, Shanxi	—	—	75	225	—	300
Shenhua Xinjiang	Urumqi, Xinjiang	—	—	—	—	80	80
Sinopec Sichuan Petrochemical Co., Ltd.	Chengdu, Sichuan	—	200	600	—	—	800
Sinopec Wuhan Petrochemical Co., Ltd.	Wuhan, Hubei	—	733	67	—	—	800
Sinopec Zhijin Petrochemical Co., Ltd	Guizhou, Guizhou	—	—	75	225	—	300
Sinopec-KPC PC JV	Zhanjiang, Guangdong	—	—	—	—	500	500
Yankuang Guohong	Zoucheng, Shandong	—	—	150	150	—	300
Yili Meidianhua	Yili, Xinjiang	—	—	—	—	300	300
Yulin Energy & Chemical Co., Ltd	Yulin, Shaanxi	—	225	75	—	—	300
	Yulin, Shaanxi	—	225	75	—	—	300
Sinopec Zhongyuan Petrochemical Co., Ltd	Puyang, Henan	75	—	—	—	—	75
Total—China		361	2,766	2,352	1,325	2,280	9,084

Source: *CMAI*
Note: *Including coal-to-ethylene additions.*

The growth in ethylene capacity between 2012 and 2016 will require approximately US$3.0 billion to US$4.0 billion of investment for ethylene crackers, including US$1.0 billion

to US$1.5 billion in ethylene cracker furnaces, as estimated by CMAI. CMAI further estimates that related investment in downstream petrochemicals facilities in China (including facilities for the production of ethylene derivatives, propylene, butadiene and aromatics, as well as secondary and tertiary derivatives) between 2012 and 2016 will be between US$35.0 billion and US$40.0 billion.

The renovation of furnaces also creates significant market opportunities for EPC service providers. CMAI estimates that around 300 furnaces were in operation in China at the end of 2011. Some of these have been in use for more than ten years and are likely to be of small scale, high energy consumption and low efficiency. As a result, they are likely to be renovated or upgraded in the next few years. In addition to replacing or renovating older furnaces, furnace tubes are typically replaced every four to six years as a part of normal maintenance, which implies that every year an average of 55 to 85 furnaces will need maintenance work. Other renovations of furnaces may involve upgrades in terms of higher capacity, better reliability or improved energy efficiency. This niche market will continue to grow in China as the base level of ethylene capacity continues to increase.

China's Coal-to-Chemicals Market Size

A number of plans and investment initiatives have been announced by government authorities in the coal-to-olefins sector in China. CMAI estimates that up to ten of these announced programs are potentially viable and could go forward between 2012 and 2016. Based on CMAI evaluations of other coal-to-olefins representative investment costs (including all unit operations and assuming a significant level of appropriate downstream derivative investments, auxiliary equipment and infrastructure), the cost for these ten projects is estimated by CMAI to be between US$30.0 billion and US$35.0 billion, in the aggregate.

Technological Strengths of Wison Engineering

The table below provides a comparison of our HS-II cracking furnace technology with the ultra selective coil (USC) design of Stone & Webster. As indicated below, furnaces produced with HS-II technology generally have lower energy consumption and longer operation cycles.

Cracking Furnace Technology Comparison

	HS-II (Wison Engineering)	USC (Stone & Webster)	Difference
Cracking furnace load, %	100%	100%	
Outlet temperature, °C	830	840	▼ 10
The highest tube wall temperature, °C	1044	1062	▼ 18
Smoke crossing temperature, °C	1071	1085	
Smoke vent temperature, °C	105	146	▼ 41
Cracking furnace thermal efficiency, %	94.85	92.5	▲2.35
Heat supply ratio in the bottom, %	60	80	
Heat supply ratio in wall side, %	40	20	
Draught fan power rating, kW	45	110	▼ 65
Cracking furnace operation days	>60	~60	

Source: CMAI

REPORT COMMISSIONED FROM CMAI

We commissioned CMAI, an independent advisor to petrochemicals industry participants in strategic and commercial planning, feasibility and financial studies, due diligence support and competitive and market analysis, to conduct an analysis of, and to report on, the petrochemicals, oil refining and coal-to-chemicals EPC markets in China. The report commissioned has been prepared by CMAI independent of our influence. We have agreed to pay CMAI US$114,000 for the commissioned report and we consider that such fee reflects market rates.

Investors should note that CMAI was engaged to prepare an EPC market study report, for use in whole or in part in this prospectus. CMAI prepared its report based on its in-house database, independent third party reports, publicly available data from government or industry publications and data provided by us. Where necessary, CMAI contacts companies operating in the industry to gather and synthesize information about markets, prices and other relevant information.

CMAI has provided part of the statistical and graphical information contained in this Industry Overview section. CMAI has advised that (i) some information in its database is derived from estimates from industry sources or subjective judgments and (ii) the information in the database of other petrochemicals data collection agencies may differ from the information in CMAI's database.

Investors should also note that no independent verification has been carried out on any facts or statistics that are directly or indirectly derived from official government and non-official sources. We believe that the sources of the information in this section are appropriate sources for such information and have taken reasonable care in extracting and reproducing such information. We have no reason to believe that such information is false or misleading or that any part has been omitted that would render such information false or misleading. We, the Global Coordinators, the Sponsors, the Joint Bookrunners, the Joint Lead Managers, any of the Underwriters, any of their respective directors and advisers or any other persons or parties involved in the Global Offering make no representation as to the accuracy of the information from official government and non-official sources, which may not be consistent with other information compiled within or outside the PRC. Accordingly, the official government and non-official sources contained herein may not be accurate and should not be unduly relied upon.