

Polyolefins

ITEM : LDPE (including L-LDPE, EVA)

(Unit: KTA)

		2014	2015	2016(E)
Supply	Production	2,469	2,668	2,820
	Import	114	116	118
	Total	2,583	2,784	2,938
Demand	Domestic	1,080	1,217	1,245
	Export	1,503	1,567	1,692
	Total	2,583	2,784	2,937
Year-end Capacity		2,608	2,838	2,838

1) The 2015 Results

In 2015, the total domestic LDPE production (including LLDPE/EVA) had increased by 8.0% (2,668KT) compared to that of in year 2014, as Hanwha Total and LG Chemical started up new plant since 2014. In year 2015, the total amount of imported LDPE products were similar to that of in year 2014.

In 2015, domestic demand of LDPE products improved with decreasing oil price. Domestic demand had increased by 12.6% with global economy recovery. LDPE export was concrete as well, increased by 4.2% in 2015. Especially LD and EVA export was increased by 7.7% and 5.5% individually. Demand kept healthy as China EVA import was increasing by 27.4% in 2015.

2) The 2016 Forecast

In 2016, the total domestic LDPE production will be 2,820KT, increase by 5.7%. SABIC SK Nexlene new 230KT(LLDPE) started up in October 2015. Also, Hanwha Total plan to revamp up 40KT(EVA) in September 2016.

The demand of domestic LDPE would grow up to 1,245KT. The export of LDPE would grow up to 1,692KT, increased by 8.0% compared to 2015. The demand and export would be recovered as sanctions imposed on Iran were lifted since January 2016. Iran export polymer to Europe further (mainly LDPE). Therefore Korean export to China will increase because of a lack of exports from Iran.

ITEM : HDPE

(Unit: KTA)

		2014	2015	2016(E)
Supply	Production	2,094	2,182	2,111
	Import	46	49	55
	Total	2,140	2,231	2,166
Demand	Domestic	943	1,026	1,077
	Export	1,197	1,205	1,089
	Total	2,140	2,231	2,166
Year-end Capacity		2,385	2,385	2,385

1) The 2015 Results

In 2015, Korea's HDPE production was increased by 4.2% at 2,182 thousand ton compared to 2014 according to market environments. Domestic demand was increased by 8.8% on account of slight recovery of domestic economy.

2) The 2016 Forecast

In 2016, Korea's HDPE production is expected to be 2,111 thousand ton which is decreased by 3.2% compared to 2015. The reason is that more turn-around are schedule. (Lotte Chemical, SK global Chemical, DaeLim etc.)

The domestic demand is expected to increase by 4.9% because of slightly recovered domestic economy. The export volume will be slightly decreased due to less production and more sales to domestic market.

ITEM : PP

(Unit: KTA)

		2014	2015	2016(E)
Supply	Production	3,990	4,000	4,087
	Import	31	30	33
	Total	4,021	4,030	4,120
Demand	Domestic	1,468	1,537	1,590
	Export	2,553	2,493	2,530
	Total	4,021	4,030	4,120
Year-end Capacity		4,240	4,257	4,257

1) The 2015 Results

In 2015, the domestic production of PP was 4,000KT, increased by 0.2% compared to 2014. The import of PP was 30KT, which is similar with 2014.

Domestic demand of PP was 1,537KT, increase by 4.7% due to lower feedstock price with recovery of construction and car industry. Therefore PP export volume was slightly decreased by 2.4% in 2015.

Even with global depression, overall PP demand was get improved in Korea and China as well. (China PP domestic demand in 2015 was 21.8 million ton, up by 6.1% year on year.)

2) The 2016 Forecast

In 2016, the domestic production of PP will be 4,087KT, increase by 2.2%, which will be stable to last year.

The export of PP will be similar to 2015, up to 2,530KT, increase by 1.5%. Chinese new projects will limit the import volume growth from Korea. Chinese new plants would start up 2,100KT in 2016(mainly MTO/CTO).

Chinese PP self-sufficiency rate was 84% in 2015, and it is expected to keep increasing with expansion in 2016.

However, as the world economy is gradually recovering, the domestic PP demand will be solid in 2016 as well. Domestic PP demand will be 1,590KT, increase by 3.4%

IV . Styrenics

Styrenics

ITEM : PS(including EPS)

(Unit: KTA)

		2014	2015	2016(E)
Supply	Production	1,000	1,029	1,066
	Import	31	41	34
	Total	1,032	1,069	1,100
Demand	Domestic	503	566	586
	Export	528	503	514
	Total	1,032	1,069	1,100
Year-end Capacity		1,206	1,241	1,251

1) The 2015 Results

The production rose in 2015 as strong domestic demand offset weak exports. As a result, although domestic demand was strong the production was 1,029 KT, only 2.9% higher than that in 2014 due to low priced-competing grades were imported.

Decrease of export was led due to following reasons; Major PS market had already established their own production capability and weak global economy(especially China and Emerging country).

In 2015, domestic demand once slowed down temporarily due to MERS virus but actually 12.5% was increased compare to the last year's demand along with the recovery of construction industry.

2) The 2016 Forecast

Slow Chinese economic growth and the improvement of emerging country's self-sufficient PS production, exporting is expected to suffer. Last year's domestic demand growth rate was 12.5% but 2016 indicates weak growth rate of 3.5%, despite the government's economic stimulus package is expected to be in effect for construction industry.

ITEM : ABS

(Unit: KTA)

		2014	2015	2016(E)
Supply	Production	1,621	1,684	1,794
	Import	7	6	6
	Total	1,629	1,690	1,800
Demand	Domestic	433	445	459
	Export	1,195	1,246	1,341
	Total	1,629	1,690	1,800
Year-end Capacity		1,786	1,786	1,936

1) The 2015 Results

Increased ABS demand from Automotive industry led ABS production to 1,684 KT, 3.9% higher compared to previous year. While export to China decreased 3%, export to Turkey and India dramatically increased 30% and 37% respectively compare to previous year. Comparing with 2014, increase of local automotive production encouraged ABS domestic demand to 445 KT which was 2.8% increase.

2) The 2016 Forecast

At the end of 2015, 100 KT of ABS production capacity expansion was completed by LG Chem so that local ABS production capacity had increased to 5.6% which gives more room for South Korean ABS makers to export.

ITEM : SM

(Unit: KTA)

		2014	2015	2016(E)
Supply	Production	3,016	2,808	3,050
	Import	861	780	710
	Total	3,877	3,588	3,760
Demand	Domestic	2,394	2,343	2,394
	Export	1,483	1,245	1,366
	Total	3,877	3,588	3,760
Year-end Capacity		3,145	3,266	3,266

1) The 2015 Results

Although Hanwha TOTAL's capacity increased to 1,050 KTA (+120 KT) by revamping its #1 plant during T/A, the domestic productions decreased by 7% compared to 2014, 2,808 KT, due to intensive T/A works by local SM makers other than SKGC during the first half of 2015, including Hanwha TOTAL, LG Chem, Lotte Chemical and YNCC. This also resulted in a 9% decrease in exports to 780 KT. Domestic downstream maintained high operation rates without any abnormalities but for T/A works, keeping the domestic demands at the previous year's level.

During the first half, spreads for naphtha were steady with an upward tendency due to SM T/A works and troubles in some plants, but the spreads turned weaker with sudden declines in oil prices and reduced demands in the Chinese market.

2) The 2016 Forecast

LG Chem (Daesan, 170 KTA facility), Hanwha Total and SKGC have T/A plans in 2016, but they are relatively smaller than that in the previous year. As a result, productions are expected to reach 3,050 KT,

a 9% YoY increase. The total demands are expected to slight increase following the expansion of LG Chem's ABS during the first half. From the viewpoint of economic feasibility, spreads are expected to be strong during the first half due to intensive T/A plans in the region, but they are likely to be reduced in the second half following SM expansions and less T/A works in the region.

V . PVC

PVC

ITEM : PVC

(Unit: KTA)

		2014	2015	2016(E)
Supply	Production	1,368	1,425	1,402
	Import	89	138	105
	Total	1,457	1,563	1,507
Demand	Domestic	875	882	887
	Export	582	681	620
	Total	1,457	1,563	1,507
Year-end Capacity		1,532	1,532	1,532

1) The 2015 Results

Decreasing oil price made ethylene based PVC price competitive compared to previous year, but weak economy of emerging countries aggravate PVC over-supply situation.

2) The 2016 Forecast

Lowered-oil will continue in 2016 and slowing down growth of China will affect PVC demand negatively. Korean Domestic PVC demand will be slightly better than 2015 due to increasing demand in construction sector.

ITEM : VCM

(Unit: KTA)

		2014	2015	2016(E)
Supply	Production	1,498	1,536	1,542
	Import	15	6	6
	Total	1,513	1,542	1,548
Demand	Domestic	1,388	1,430	1,430
	Export	125	109	115
	Total	1,513	1,539	1,545
Year-end Capacity		1,577	1,577	1,577

1) The 2015 Results

Overall, total export volume decreased in 2015 as the demand for self - consumption increased. In Korea, domestic demand mostly accounted for self-consumption to produce PVC. The export volume depended on the operating rates of PVC plants overseas.

There was an VCM expansion in Japan to start its operation in early 2015. Since then, tightness of VCM supply in Northeast Asia region have been relieved to some extent. After VCM price weakened in the beginning of 2015, the market price started to be in upward trend in late 1Q on the back of improving PVC market sentiment combined with VCM major suppliers' outages for maintenance in March.

However, the upward momentum in PVC prices diminished from June 2015 as global PVC demand started to decline with the monsoon season being closer and VCM supply recovered from outages. As a result, PVC prices in the export market started to decrease.

Accordingly, VCM export market continued on a downward trend in July but there was no further weakness in VCM price during August~September thanks to limited VCM supply with several VCM producers' T/A schedule.

From October, with worsening PVC market by entering typical weak-demand season, VCM price began to drop and had been in bearish sentiment.

2) The 2016 Forecast

There will be no significant change of VCM supply-demand balance in Korea, 2016, except that total export volume is expected to show a slight increase with more VCM production compared to last year's.

Considering VCM expansion in Indonesia scheduled to start up in March 2016, Asian VCM market balance will be shifting to 'loose' position. As a result, a price spread between PVC and VCM is likely to be widened, which will lead to an increase of VCM trading volume.

VI. Synthetic Rubber

Synthetic Rubber

ITEM : SBR/BR

(Unit: KTA)

		2014	2015	2016(E)
Supply	Production	855	883	890
	Import	80	87	91
	Total	935	970	981
Demand	Domestic	121	146	151
	Export	813	824	830
	Total	935	970	981
Year-end Capacity		1,196	1,217	1,217

1) The 2015 Results

Weak demand of synthetic rubber in tire market couldn't allow most of rubber makers' margin to be improved. Unfavorable exchange rates such as Yen devaluated over USD made export of Korean origins more difficult to compete. Slow recovery of Europe and US economies couldn't vitalize rubber industry enough to settle appropriate profits to suppliers. US government's restriction of Chinese origin tires into the states brought tougher competition in Asia market.

2) The 2016 Forecast

Rebound of European economy and US maintaining expectedly in stable recover is expected to elaborate global tire industry. Spread of needs of environment friendly products originated from Europe into global tire market possibly accelerates shifting of its raw materials into special type of polymers such as Solution SBR. Supply and demand in synthetic rubber market is expected to be gradually balanced due to no significant growth of commodity production during last a few years. Synthetic rubber makers expect their sales margins to be recovered.

VII. Synthetic Fiber Raw Materials

Synthetic Fiber Raw Materials

ITEM : AN

(Unit: KTA)

		2014	2015	2016(E)
Supply	Production	700	646	723
	Import	90	104	90
	Total	790	750	813
Demand	Domestic	514	509	530
	Export	276	241	283
	Total	790	750	813
Year-end Capacity		850	850	850

1) The 2015 Results

Compared to 2014, domestic AN demand in Korea was stable despite global economic recession but export decreased by 12.7% because of expansion in China. In terms of Supply, production was reduced by 7.7% due to unplanned S/D and cutbacks. Meanwhile, import increased by 15.4%.

2) The 2016 Forecast

Domestic demand is expected to grow 8.4% in accordance with positive outlook in ABS sector and oversea market. Whereas, import will decline by 13.4%. Supply also will increase 11.9% due to T/A period shortening and export recover.

ITEM : Caprolactam

(Unit: KTA)

		2014	2015	2016(E)
Supply	Production	143	94	154
	Import	0	0	0
	Total	143	94	154
Demand	Domestic	142	89	145
	Export	0	4	9
	Total	143	94	154
Year-end Capacity		270	270	270

1) The 2015 Results

In terms of caprolactam (CPL), which is the main product of Capro Corp., the production capacity expansion in China continued in 2015. It therefore exacerbated the over-supply situation in the global caprolactam industry, furthermore intensified the export competition by countries. Although the feedstock price of caprolactam decreased due to lower crude oil price, the caprolactam price declined more than the feedstock price. Capro Corp., therefore, adjusted the production rates and output to minimize the loss.

2) The 2016 Forecast

Most companies have suffered huge losses under the bearish caprolactam industry. The capacity rationalization in the Chinese petrochemical industry, which has started since the end of last year, is expected to continue this year. Thus, there will be some adjustment of supply/demand balance in the caprolactam industry.

ITEM : MEG

(Unit: KTA)

		2014	2015	2016(E)
Supply	Production	1,067	1,179	1,216
	Import	320	330	340
	Total	1,387	1,509	1,556
Demand	Domestic	845	974	983
	Export	543	535	573
	Total	1,388	1,509	1,556
Year-end Capacity		1,590	1,665	1,665

1) The 2015 Results

MEG demand in Korea was about 1,500 thousand tons in 2015, slightly increased by 8% compared to previous year's 1,307 thousand tons. The main cause for this is the increase of polyester & PET(plants) demand. The total MEG import figure was marginally increased to 330 thousand tons which is less than expected.

The total MEG export value was decreased a little bit. This is because , in the China market, both expansion of local MEG plants and poor economy had lower demands of MEG. As a new MEG plant was established by KPIC, the existing(major) four suppliers increased the capacity to 1,410 tons in total.

2) The 2016 Forecast

The demand for MEG is expected to increase due to capacity expansion of Chinese Polyester makers. MEG production in China is expected to increase but most of the increased production will be CT MEG, which means factors such as decreased oil price or quality issues can result in deferral of capacity expansion of CT MEG. In that case the supply of MEG might become tight but Chinese import dependency on MEG will gradually decrease and will partially limit the rise of MEG price.

ITEM : PTA

(Unit: KTA)

		2014	2015	2016(E)
Supply	Production	5,333	4,826	4,641
	Import	0	0	0
	Total	5,333	4,826	4,641
Demand	Domestic	2,661	2,511	2,441
	Export	2,672	2,315	2,200
	Total	5,333	4,826	4,641
Year-end Capacity		6,340	6,340	6,340

1) The 2015 Results

In 2015, we saw various company reshuffles in the PTA market due to weakening economics. As a result, the annual PTA output was reduced by 507 kt to 4,715 km. It is estimated that the reductions in Capacity come from stopped/scratched plants.

On the demand side, the increase of the Chinese Self-Sufficiency rate combined with the levy of Anti-dumping duties for Indian material resulted in a reduction of Asian demand for PTA and a rapid shift to exports to off-shore markets. It is estimated that Exoport dropped by 357 kt to 2,315 kt.

2) The 2016 Forecast

Market prospects are rather opaque for 2016 with low chances of improvement in market economics. Overall Growth rate in PTA production has slowed down but new capacities in China are expected to come in line adding pressure to the export market. Prospects for 2016 remain unclear. Overall annual production Capacity is expected to fall to 4,641 kt whilst Export is expected to fall to 2,200 kt.

VIII. Chemicals

Chemicals

ITEM : Phthalic Anhydride

(Unit: KTA)

		2014	2015	2016(E)
Supply	Production	396	385	373
	Import	0	0	0
	Total	396	385	373
Demand	Domestic	205	201	212
	Export	191	184	161
	Total	396	385	373
Year-end Capacity		405	405	405

1) The 2015 Results

DOMESTIC MARKET, Price-cut competition was more intense due to oversupply through reduction of the market and decline in raw material prices through falling oil prices. Regulations of using phthalic-based plastcizers were thoghened, and PA market (Alkyd resin, Paint, Pigment) has been downsizing. These things had a influence to reduce the demand. EXPORT MARKET, Selling prices fell down due to the situation of global low oil prices.

2) The 2016 Forecast

DOMESTIC MARKET, Despite the reduction of the demand, but the market price will be rised due to a tight supply of raw materials.

EXPORT MARKET, The market price is expected to rise by the situation of oil prices and upstream rebounding.

The international price is possible to jump due to a tight supply through the maintenance schedule in second quarter.

ITEM : Acetic Acid

(Unit: KTA)

		2014	2015	2016(E)
Supply	Production	550	520	563
	Import	52	54	54
	Total	602	574	617
Demand	Domestic	441	421	419
	Export	157	163	187
	Total	598	584	606
Year-end Capacity		570	570	570

1) The 2015 Results

Under Chinese AA over-supply environment and weak demand from key downstream (PTA, EA) will last overall over-supply market. Temporally stock shortage due to key producers unplanned TAR from 2nd quarter bounced AA price. After the time to restart up AA price turned to downturn and weak crude helped to pull down AA price

Weak crude price pulling down AA raw material (methanol) and AA price. Coal based Chinese AA producers became a cost competitive disadvantage position than Naphtha or heavy oil based AA producers.

2) The 2016 Forecast

Developing operation skills of Chinese AA producers aggravate AA over-supply market environment. However, AA demand from PTA and EA still bearish. Temporarily limited stock inventory following key producers' unplanned TAR from early April to mid-May help to bounce AA price

Coal based Chinese AA producers are still struggling with marginal production cost (\$250). Poor Chinese PTA O/R as 65~70% is still

ongoing and will be last for a while. Nothing better Korean PTA producers' O/R

Despite poor Chinese EA O/R, Korean EA O/R is still high because of ADD effect. Also VAM enjoy healthy demand with EVA expansion last couple of years.

Bouncing AA bottom price due to some producers unplanned TAR in Q2. But not last longer. Raw material (MeOH) movement will be mostly only factor what may effect AA price.

ITEM : Phenol

(Unit: KTA)

		2014	2015	2016(E)
Supply	Production	1,021	1,051	1,180
	Import	45	32	30
	Total	1,066	1,083	1,210
Demand	Domestic	837	901	905
	Export	229	182	305
	Total	1,066	1,083	1,210
Year-end Capacity		985	985	1,285

1) The 2015 Results

2015	1Q	2Q	3Q	4Q
Spread (Phenol-Benzene)	Positive	Little Negative	Little Negative	Little Negative
Price (ICIS CMP Avg.)	USD909/MT	USD979/MT	USD883/MT	USD775/MT

During 1Q, Phenol shortage in Asia made the market price rise. ① Delay of New expansion plant in China(FCFC,CEPSA), ②Simultaneous T/A in Korean (LGChem and KPB), ③Nanya Ningbo BPA Plant in China started up before their own Phenol Plant started operation and Bayer purchased from Chinese general market before Cepsa started operation

During 2Q, Phenol supply increased as New expansion plants in China started operation(SSMC,FCFC,CEPSA). It made the spread between phenol and benzene squeeze.

During 3Q~4Q, Extreme competition among Chinese manufacturers made price and operation rate decreased.

Phenol demand increased in Korea because of the high operation

rate of domestic PC and Epoxy. (BPA demand decreased), Phenol resin and Anti-Oxidant demand also kept normal.

2) The 2016 Forecast

2016	1Q	2Q	3Q	4Q
Spread (Phenol-Benzene)	Little Positive	Little Positive	Negative	Negative

During 1Q : The decrease of Phenol supply of Asia make the market price rise. ①Delay of New expansion plants(Thailand PTT #2 250KT, Korea KPB #4 300KT) , ②Restricted in flow of EU origin material to India due to the Final result of Anti-Dumping ③Plants T/A in the region, ④Decrease in operation rate of Chinese local makers

During2Q : The increase of Deep Sea origin price (because of high Raw material price), Asian plants T/A and the low operation rate of the local makers in China make the market price keep high.

During3~4Q : The increase of Phenol supply from New expansion is expected to make the market price decline.

Phenol demand will be maintained in Korea as the operation rate of domestic PC and Epoxy is on par with the last year. But the export will increase as the production rises. Phenol resin and Anti-Oxidant demand is maintained.