SK Energy Daily

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SK 증권

2018년 8월 28일

1. News Summary (3 page)

News	
WTI comment	소폭 상승…WTI 0.2%↑
Headline	아람코, 자국 내 원유와 가스에 대한 개발 및 생산 영구권 박탈
News 1.	가즈프롬, 해상 가스 파이프라인 길이 global record 기록
News 2.	-
News 3.	-
News 4.	-

Conclusion
영구권 박탈은 상장을 꺼려하는 아람코에 대한 정부의 압박으로 해석됨
러시아의 對 유럽 PNG 수출은 지속적으로 상승할 것으로 전망됨
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2. Prices Summary (4~7 page)

Daily	Unit	Price	1D	1W	1M	3M	12M
Refinery			%	%	%	%	%
WTI	$/bbl	68.9	0.2	3.7	0.3	1.5	47.9
Dubai	$/bbl	74.4	0.6	5.1	1.3	(1.8)	47.2
Gasoline	$/bbl	86.1	(0.0)	3.7	1.5	(4.1)	24.8
Diesel	$/bbl	90.2	0.2	4.2	3.8	(0.5)	40.8
Complex margin	$/bbl	7.4	(0.6)	(0.9)	(0.3)	(0.4)	(2.0)
1M lagging	$/bbl	9.3	(1.1)	(0.1)	1.3	(3.9)	(1.6)
Petrochemical			%	%	%	%	%
Naphtha	$/t	660	(0.1)	3.2	(2.0)	(3.8)	38.6
Butadiene	$/t	1,750	0.0	2.0	5.4	1.7	33.6
HDPE	$/t	1,290	0.0	(0.8)	(1.5)	(5.8)	12.7
MEG	$/t	935	(0.4)	1.1	1.2	2.9	4.1
PX	$/t	1,251	2.0	4.3	21.3	24.5	54.2
SM	$/t	1,392	(0.3)	(1.5)	1.9	0.5	12.3
Commodity			%	%	%	%	%
Natural Gas	$/mmbtu	2.88	(1.4)	(2.2)	2.8	(3.1)	(0.9)
Natural rubber	$/t	1,340	(0.7)	0.8	3.1	(5.6)	(13.0)
Cotton	C/lbs	83.5	2.1	0.5	(7.1)	(6.4)	18.8

*참고: 정제마진의 변동률은 %가 아닌 $/bbl임

Weekly	Update	Unit	Price	1W	1M	3M	12M
Petrochemical				%	%	%	%
Ethylene	08/27	$/t	1,255	(1.6)	1.8	6.8	5.9
Propylene	08/27	$/t	1,043	(0.5)	4.8	1.0	32.0
Benzene	08/27	$/t	888	(0.3)	4.7	3.8	11.6
Toluene	08/27	$/t	815	(0.6)	1.9	(1.2)	24.4
Xylene	08/27	$/t	860	1.8	4.6	3.0	37.1
PP	08/27	$/t	1,233	0.0	0.0	(5.0)	10.3
PVC	08/27	$/t	950	0.0	0.5	3.3	3.3
ABS	08/27	$/t	1,920	(2.0)	(1.0)	(7.7)	1.3
SBR	08/27	$/t	1,875	0.0	6.5	(0.8)	13.6
SM	08/27	$/t	1,440	(2.0)	3.2	0.0	15.9
BPA	08/27	$/t	1,905	1.9	6.9	9.6	(4.4)
Caustic	08/27	$/t	421	0.0	16.6	(24.8)	(10.6)
2-EH	08/27	$/t	1,130	0.0	3.2	(4.2)	14.1
Caprolactam	08/27	$/t	2,160	0.2	0.2	2.9	22.0
Solar				%	%	%	%
Polysilicon	08/22	$/kg	11.3	(0.7)	3.3	(25.4)	(27.4)
Module	08/22	$/W	0.25	(0.4)	(1.6)	(14.6)	(21.5)

3. Global Peers Summary (8~9 page)

	Unit	Price	1D	1W	1M	3M	12M
E&P			%	%	%	%	%
ExxonMobil	USD	80.4	1.0	2.0	(1.9)	2.1	4.8
Shell	EUR	2,564	0.0	3.0	(1.4)	0.2	19.6
Petrochina	CNY	8.26	1.6	1.0	9.0	1.6	2.4
Gazprom	RUB	144.5	0.6	2.1	4.7	(0.4)	22.6
Petrobras	BRL	18.7	2.2	1.9	(5.4)	(5.5)	34.8
Refinery							
Phillips66	USD	120.0	0.7	3.4	1.0	3.8	43.9
Valero	USD	121.2	0.5	6.9	4.2	2.1	79.1
JX	JPY	793.1	2.0	5.1	(4.3)	10.7	46.1
Neste Oil	EUR	74.8	0.3	2.2	6.0	11.6	108.8

	Unit	Price	1D	1W	1M	3M	12M
Petrochemical			%	%	%	%	%
BASF	EUR	80.9	1.6	2.8	(1.6)	(7.5)	(1.5)
DowDuPont	USD	70.8	2.3	3.4	3.6	7.8	9.7
SABIC	SAR	125.4	0.2	2.0	(3.4)	3.6	27.3
Formosa Pla.	TWD	113.5	0.9	4.1	2.7	4.6	20.9
Shin-Etsu	JPY	10,710	1.1	3.2	(5.4)	(5.3)	11.5
Renewable							
Wacker	EUR	126.8	0.8	3.4	4.8	(15.0)	18.8
First Solar	USD	52.61	1.0	0.6	1.9	(22.9)	10.9
GCL-Poly	HKD	0.54	1.9	0.0	(22.9)	(41.9)	(39.3)
Tesla Motors	USD	319.3	(1.1)	3.5	7.4	14.5	(8.3)

4. Coverage Summary

	08/27	1D	1W	1M	3M	6M	12M	투자의견	TP	%	P/E	P/B
KOSPI	2,299	0.3	2.3	0.2	(6.4)	(6.2)	(3.3)				* 추정치는 12M fwd 기준임	
KOSPI화학	5,644	0.6	1.2	(0.2)	(4.6)	(8.0)	(2.0)				* 모든 coverage 업체의 실적은 연결기준임	
LG화학	372,000	1.6	1.6	(0.7)	8.3	(4.4)	0.9	매수	400,000	7.5	14.70	1.66
롯데케미칼	311,000	(0.2)	(8.0)	(11.8)	(16.6)	(32.5)	(20.1)	매수	400,000	28.6	9.66	0.88
한화케미칼	19,600	0.0	(4.9)	(8.0)	(27.5)	(42.0)	(45.1)	매수	30,000	53.1	8.81	0.48
금호석유화학	101,000	(1.5)	1.6	(6.9)	(3.3)	14.0	31.2	매수	150,000	48.5	9.42	1.31
KCC	332,000	(0.4)	(0.3)	3.4	(5.5)	(8.8)	(15.7)	매수	400,000	20.5	28.78	0.51
OCI	115,000	5.0	0.4	13.3	(17.9)	(28.3)	20.0	매수	140,000	21.7	8.75	0.83
SKC	45,900	0.3	(1.1)	4.1	15.5	20.2	22.4	매수	50,000	8.9	12.52	1.09
SK이노베이션	197,000	(0.3)	(1.5)	(0.8)	(3.7)	(1.3)	9.1	매수	230,000	16.8	11.58	0.99
S-Oil	122,000	(0.8)	(2.8)	8.0	12.4	2.5	4.3	매수	140,000	14.8	13.93	2.04
GS	54,000	0.7	(0.4)	2.5	(8.8)	(16.4)	(20.7)	매수	80,000	48.1	5.00	0.61
SK가스	84,000	(0.1)	(2.0)	(0.7)	(15.2)	(9.9)	(23.6)	매수	130,000	54.8	7.94	0.57
포스코대우	17,750	(0.3)	(2.5)	(5.1)	(24.0)	(16.5)	(18.0)	매수	25,000	40.8	9.31	0.69
LG상사	21,900	(1.6)	(5.2)	(3.9)	(19.5)	(21.2)	(23.8)	매수	38,000	73.5	8.11	0.62
한국전력	30,750	0.0	(1.6)	(5.4)	(10.7)	(8.8)	(30.5)	매수	45,000	46.3	7.44	0.24
한국가스공사	52,900	(1.9)	(4.2)	(7.7)	(12.9)	11.5	15.1	매수	75,000	41.8	8.21	0.69

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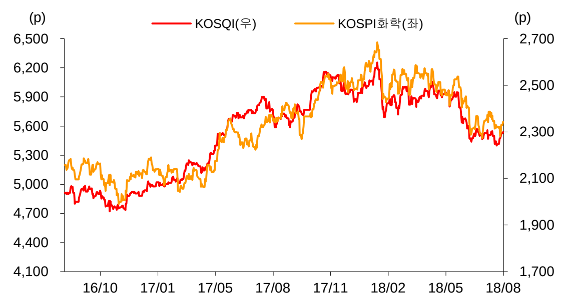
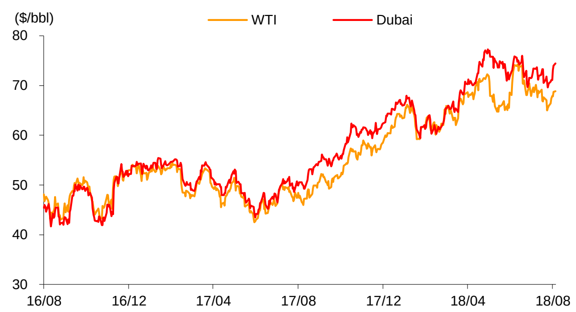
Key Chart

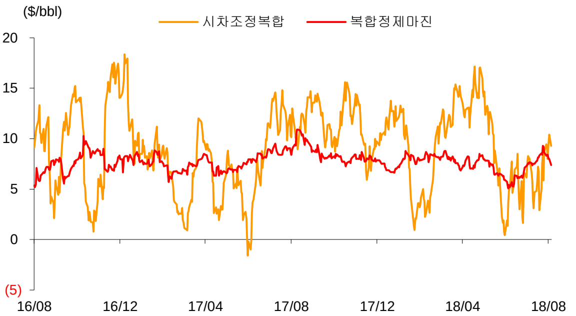
KOSPI/KOSPI화학



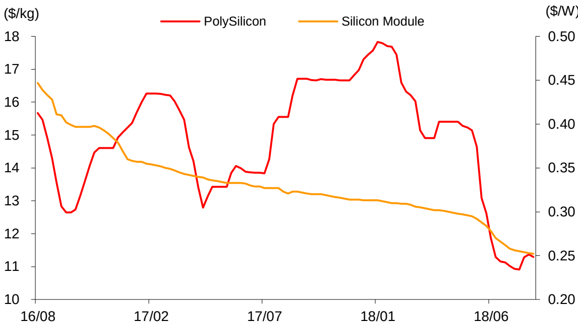
WTI/Dubai



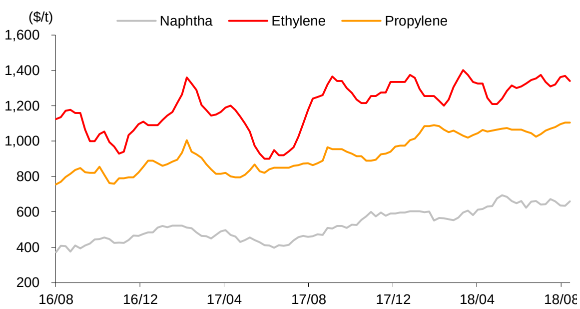
Complex & 1M lagging margin



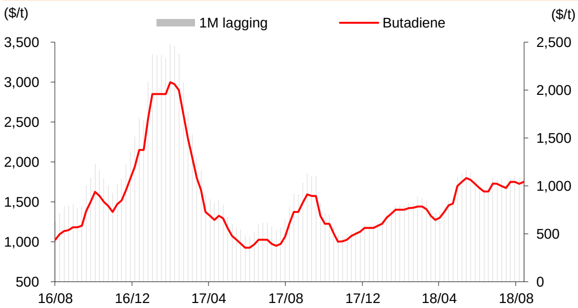
Polysilicon & Module prices



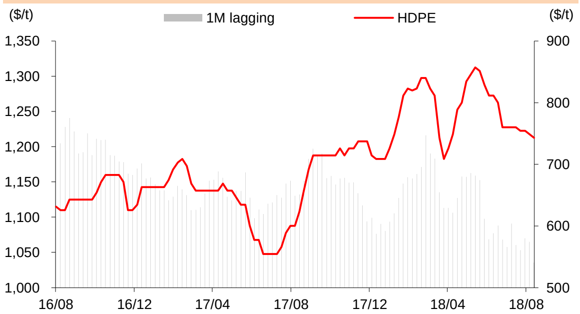
Naphtha/Ethylene/Propylene prices



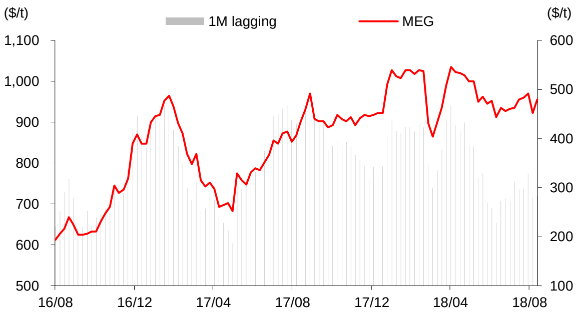
Butadiene price & 1M lagging naphtha spread



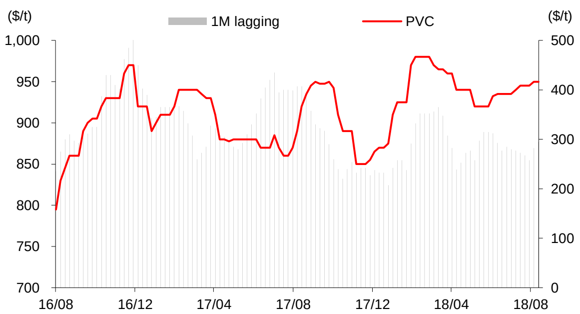
HDPE price & 1M lagging naphtha spread



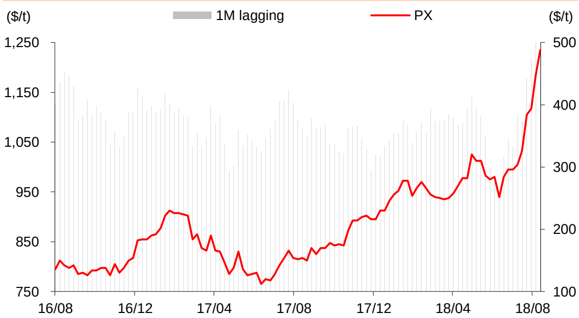
MEG price & 1M lagging naphtha spread



PVC price & 1M lagging naphtha spread



PX price & 1M lagging naphtha spread



자료: Bloomberg, Cischem, Petronet, Platts, Pvinsights, SK증권
참고: 상기 데이터는 일괄적으로 과거 2년치 적용

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News Comment

Headline	(출처: Financial Times)
제목	아람코, 자국 내 원유와 가스에 대한 개발 및 생산 영구권 박탈
결론	영구권 박탈은 상장을 꺼려하는 아람코에 대한 정부의 압박으로 해석됨
세부	
	1) 아람코의 원유와 가스 생산 영구권이 박탈되며 정부와의 갈등이 표면화
	2) 칼리드 알 팔리, "IPO의 일환으로 새로운 양해각서가 체결되었다"
	3) 영구권을 박탈하고 40년의 개발 및 생산권에 대한 새 양해각서 체결
	4) 관계자, "석유 회사들은 개발권 기간이 짧을수록 생산을 빨리 해야함"
	5) 영구권 박탈은 상장을 꺼려하는 아람코에 대한 정부의 압박으로 해석됨

WTI Comment	(출처: 연합뉴스)
제목	소폭 상승…WTI 0.2%↑
상승 요인	예고된 미국의 대이란 원유제재
하락 요인	미중 무역전쟁 여파

Issue 1	(출처: Tass)
제목	가즈프롬, 해상 가스 파이프라인 길이 global record 기록
결론	러시아의 對 유럽 PNG 수출은 지속적으로 상승할 것으로 전망됨
세부	
	1) 가즈프롬이 TurkStream 설치로 인해 해상 가스 파이프라인 길이 증가
	2) 7월 중순 기준 TurkStream은 해상 파이프의 66%인 1,230km가 설치됨
	3) '17년 5월 가즈프롬은 흑해 연안에서 TurkStream의 해상 부분 건설 시작
	4) 파이프라인은 2개이며 각각 15.75bcm/년의 capa를 보유하게 될 것임
	5) 러시아의 對 유럽 PNG 수출은 지속적으로 상승할 것으로 전망됨

Issue 2	
제목	
결론	
세부	
	1)
	2)
	3)
	4)
	5)

Issue 3	
제목	
결론	
세부	
	1)
	2)
	3)
	4)
	5)

Issue 4	
제목	
결론	
세부	
	1)
	2)
	3)
	4)
	5)

Issue 5	
제목	
결론	
세부	
	1)
	2)
	3)
	4)
	5)

Issue 6	
제목	
결론	
세부	
	1)
	2)
	3)
	4)
	5)

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Commodity Price Data

Daily Price		Today	1D	1W	1M	3M	6M	12M	YTD	2016avg.	2017avg.	2018acc.
F/X	USD/EUR	0.856	0.861	0.871	0.858	0.858	0.817	0.839	0.833	0.904	0.887	0.835
	Change, %		*(0.5)*	*(1.7)*	*(0.2)*	*(0.2)*	*4.8*	*2.1*	*2.8*	*(5.3)*	*(3.4)*	*2.5*
	USD/JPY	111.1	111.2	110.1	111.1	109.4	107.3	109.4	112.6	108.8	112.1	109.3
	Change, %		*(0.1)*	*0.9*	*0.0*	*1.5*	*3.5*	*1.6*	*(1.4)*	*2.1*	*(0.9)*	*1.6*
	USD/KRW	1,113.9	1,118.9	1,123.2	1,118.1	1,077.9	1,071.3	1,128.4	1,066.7	1,160.5	1,130.9	1,087.5
	Change, %		*(0.4)*	*(0.8)*	*(0.4)*	*3.3*	*4.0*	*(1.3)*	*4.4*	*(4.0)*	*(1.5)*	*2.4*
Agriculture	Corn	346.8	348.5	362.0	362.0	406.0	370.5	338.8	350.8	358.5	359.4	369.9
	Change, %		*(0.5)*	*(4.2)*	*(4.2)*	*(14.6)*	*(6.4)*	*2.4*	*(1.1)*	*(3.3)*	*(3.5)*	*(6.3)*
	Soybean	834.8	842.0	881.8	870.5	1,041.5	1,038.0	939.0	951.8	987.5	975.9	965.9
	Change, %		*(0.9)*	*(5.3)*	*(4.1)*	*(19.9)*	*(19.6)*	*(11.1)*	*(12.3)*	*(15.5)*	*(14.5)*	*(13.6)*
	Wheat	499.3	514.8	542.3	530.5	543.0	463.3	409.5	427.0	436.4	436.0	487.8
	Change, %		*(3.0)*	*(7.9)*	*(5.9)*	*(8.1)*	*7.8*	*21.9*	*16.9*	*14.4*	*14.5*	*2.3*
	Rice	10.5	10.8	10.3	12.0	11.6	12.0	12.4	11.7	10.3	11.1	12.0
	Change, %		*(2.5)*	*2.4*	*(12.5)*	*(9.1)*	*(12.1)*	*(15.2)*	*(10.0)*	*1.6*	*(5.0)*	*(12.6)*
	Oats	247.3	259.5	260.8	232.0	248.8	260.0	241.3	241.0	196.3	252.3	246.5
	Change, %		*(4.7)*	*(5.2)*	*6.6*	*(0.6)*	*(4.9)*	*2.5*	*2.6*	*26.0*	*(2.0)*	*0.3*
MYR/mt	Palm Oil	2,166.0	2,178.0	2,215.0	2,122.0	2,453.0	2,556.0	2,733.0	2,444.0	2,653.8	2,787.3	2,369.0
	Change, %		*(0.6)*	*(2.2)*	*2.1*	*(11.7)*	*(15.3)*	*(20.7)*	*(11.4)*	*(18.4)*	*(22.3)*	*(8.6)*
	Cocoa	2,321.0	2,374.0	2,198.0	2,233.0	2,556.0	2,239.0	1,962.0	1,892.0	2,854.0	2,005.2	2,363.9
	Change, %		*(2.2)*	*5.6*	*3.9*	*(9.2)*	*3.7*	*18.3*	*22.7*	*(18.7)*	*15.7*	*(1.8)*
	Cotton	83.5	81.8	83.1	89.1	89.2	81.8	68.6	78.6	65.6	73.5	84.2
	Change, %		*2.1*	*0.5*	*(6.2)*	*(6.4)*	*2.2*	*21.7*	*6.2*	*27.3*	*13.6*	*(0.8)*
	Sugar	10.5	10.2	10.1	10.9	12.5	13.0	14.0	15.2	18.2	15.8	12.2
	Change, %		*2.7*	*4.2*	*(3.4)*	*(15.7)*	*(19.2)*	*(25.1)*	*(30.7)*	*(42.1)*	*(33.6)*	*(14.1)*
	Coffee	101.9	100.6	97.3	110.5	120.4	120.0	130.2	126.2	136.1	133.0	116.1
	Change, %		*1.3*	*4.7*	*(7.8)*	*(15.4)*	*(15.1)*	*(21.8)*	*(19.3)*	*(25.1)*	*(23.4)*	*(12.3)*
Energy	WTI	68.9	68.7	66.4	68.7	67.9	63.0	47.9	60.4	43.4	51.0	66.4
	Change, %		*0.2*	*3.7*	*0.3*	*1.5*	*9.3*	*43.9*	*14.0*	*58.7*	*35.1*	*3.7*
	Brent	76.2	75.8	72.2	74.3	76.4	66.6	52.4	66.9	45.1	54.9	71.9
	Change, %		*0.5*	*5.5*	*2.6*	*(0.3)*	*14.4*	*45.4*	*14.0*	*69.1*	*38.9*	*6.0*
	Natural Gas	2.9	2.9	2.9	2.8	2.9	2.7	2.9	3.0	2.6	3.0	2.8
	Change, %		*(1.4)*	*(2.2)*	*1.9*	*(2.1)*	*7.2*	*(0.6)*	*(2.6)*	*12.7*	*(4.8)*	*1.2*
	Ethanol	1.3	1.3	1.4	1.4	1.5	1.5	1.5	1.3	1.5	1.5	1.4
	Change, %		*(0.3)*	*(3.4)*	*(8.9)*	*(12.8)*	*(11.5)*	*(12.7)*	*(0.8)*	*(13.6)*	*(12.5)*	*(8.4)*
	RBOB Gasoline	209.0	207.8	201.5	216.2	218.1	180.3	166.7	179.9	140.0	162.9	200.9
	Change, %		*0.6*	*3.7*	*(3.3)*	*(4.2)*	*15.9*	*25.4*	*16.1*	*49.3*	*28.3*	*4.0*
	Coal	118.9	117.9	117.7	119.9	105.5	104.3	98.6	100.8	65.5	88.2	106.8
	Change, %		*0.8*	*1.1*	*(0.8)*	*12.8*	*14.0*	*20.6*	*18.0*	*81.6*	*34.8*	*11.3*
Metal	Gold	1,211.4	1,205.9	1,190.5	1,223.3	1,301.7	1,318.3	1,291.4	1,302.6	1,248.5	1,258.6	1,294.2
	Change, %		*0.5*	*1.8*	*(1.0)*	*(6.9)*	*(8.1)*	*(6.2)*	*(7.0)*	*(3.0)*	*(3.8)*	*(6.4)*
	Silver	14.9	14.8	14.8	15.5	16.5	16.4	17.1	16.9	17.1	17.1	16.3
	Change, %		*0.6*	*1.0*	*(3.8)*	*(9.8)*	*(9.3)*	*(12.7)*	*(12.1)*	*(12.9)*	*(12.7)*	*(8.8)*
	Copper	6,105.0	6,105.0	5,991.5	6,297.0	6,885.0	7,021.0	6,666.0	7,247.0	4,872.0	6,199.4	6,757.7
	Change, %		*0.0*	*1.9*	*(3.0)*	*(11.3)*	*(13.0)*	*(8.4)*	*(15.8)*	*25.3*	*(1.5)*	*(9.7)*
	Nickel	932.2	933.7	946.5	941.3	994.1	898.0	729.3	809.1	646.4	680.2	921.3
	Change, %		*(0.2)*	*(1.5)*	*(1.0)*	*(6.2)*	*3.8*	*27.8*	*15.2*	*44.2*	*37.0*	*1.2*
	Zinc	2,534.0	2,534.0	2,377.5	2,596.0	3,051.0	3,487.0	3,063.5	3,319.0	2,097.5	2,888.5	3,079.5
	Change, %		*0.0*	*6.6*	*(2.4)*	*(16.9)*	*(27.3)*	*(17.3)*	*(23.7)*	*20.8*	*(12.3)*	*(17.7)*
	Lead	2,079.0	2,079.0	1,965.5	2,136.0	2,437.3	2,576.3	2,306.3	2,482.8	1,868.3	2,315.7	2,375.7
	Change, %		*0.0*	*5.8*	*(2.7)*	*(14.7)*	*(19.3)*	*(9.9)*	*(16.3)*	*11.3*	*(10.2)*	*(12.5)*
	Aluminum	14,720.0	14,680.0	14,355.0	14,300.0	14,725.0	14,160.0	16,465.0	15,020.0	12,373.5	14,556.6	14,352.0
	Change, %		*0.3*	*2.5*	*2.9*	*(0.0)*	*4.0*	*(10.6)*	*(2.0)*	*19.0*	*1.1*	*2.6*
	Cobalt	63,806.0	63,806.0	63,814.0	69,750.0	90,750.0	80,900.0	60,750.0	75,205.0	25,480.1	55,906.9	80,450.6
	Change, %		*0.0*	*(0.0)*	*(8.5)*	*(29.7)*	*(21.1)*	*5.0*	*(15.2)*	*150.4*	*14.1*	*(20.7)*
	HR Coil	903.0	901.0	902.0	887.0	875.0	746.0	621.0	662.0	519.3	620.1	837.2
	Change, %		*0.2*	*0.1*	*1.8*	*3.2*	*21.0*	*45.4*	*36.4*	*73.9*	*45.6*	*7.9*
	Scrap	376.0	376.0	380.0	393.0	395.0	387.0	372.0	367.0	275.7	344.7	389.0
	Change, %		*0.0*	*(1.1)*	*(4.3)*	*(4.8)*	*(2.8)*	*1.1*	*2.5*	*36.4*	*9.1*	*(3.3)*

자료: Bloomberg

참고) NYMEX, ICE, LME 중 대표지수를 사용

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Refining Price Data

Daily Price		08/27	1D	1W	1M	3M	6M	12M	YTD	2015avg.	2016avg.	2017acc.
Crude Oil	**WTI**	68.9	68.7	66.4	68.7	67.9	63.9	46.6	53.7	43.4	50.9	66.4
	Change, %		*0.2*	*3.7*	*0.3*	*1.5*	*7.8*	*47.9*	*28.2*	*58.8*	*35.3*	*3.8*
	Dubai	74.4	74.0	70.8	73.4	75.8	63.9	50.6	53.8	41.3	53.1	69.2
	Change, %		*0.6*	*5.1*	*1.3*	*(1.8)*	*16.4*	*47.2*	*38.2*	*80.1*	*40.2*	*7.6*
Crude Oil Product	**Gasoline(휘발유)**	86.1	86.1	83.0	84.8	89.8	77.5	69.0	69.8	56.3	68.0	81.7
	Change, %		*(0.0)*	*3.7*	*1.5*	*(4.1)*	*11.1*	*24.8*	*23.2*	*53.0*	*26.5*	*5.4*
	Kerosene(등유)	88.7	88.8	86.0	88.3	91.1	83.9	63.7	66.4	52.9	65.2	84.5
	Change, %		*(0.1)*	*3.1*	*0.4*	*(2.6)*	*5.8*	*39.2*	*33.5*	*67.7*	*36.0*	*4.9*
	Diesel(경유)	90.2	90.0	86.5	86.9	90.7	78.7	64.1	65.5	52.1	65.6	83.6
	Change, %		*0.2*	*4.2*	*3.8*	*(0.5)*	*14.5*	*40.8*	*37.7*	*73.0*	*37.5*	*7.9*
	Bunker-C	68.3	69.4	67.6	71.8	69.4	57.8	47.4	52.1	35.5	49.7	63.8
	Change, %		*(1.6)*	*1.1*	*(4.8)*	*(1.5)*	*18.2*	*44.2*	*31.3*	*92.3*	*37.6*	*7.1*
	Naphtha	71.7	71.7	69.5	73.8	76.0	62.3	51.4	53.5	42.6	53.7	68.3
	Change, %		*0.0*	*3.2*	*(2.8)*	*(5.6)*	*15.1*	*39.7*	*34.2*	*68.4*	*33.5*	*5.1*
Dubai Spread	**Gasoline(휘발유)**	11.6	12.1	12.2	11.4	14.0	13.6	18.4	16.0	14.9	14.9	12.5
	Change		*(0.5)*	*(0.5)*	*0.3*	*(2.3)*	*(1.9)*	*(6.8)*	*(4.4)*	*(3.3)*	*(3.3)*	*(0.9)*
	Kerosene(등유)	14.3	14.8	15.2	14.9	15.3	20.0	13.2	12.6	11.6	12.1	15.3
	Change		*(0.5)*	*(0.9)*	*(0.6)*	*(1.0)*	*(5.7)*	*1.1*	*1.7*	*2.7*	*2.1*	*(1.1)*
	Diesel(경유)	15.8	16.0	15.7	13.5	14.9	14.8	13.5	11.7	10.8	12.5	14.4
	Change		*(0.2)*	*0.1*	*2.3*	*0.9*	*0.9*	*2.3*	*4.1*	*5.0*	*3.3*	*1.3*
	Bunker-C	(6.1)	(4.6)	(3.2)	(1.7)	(6.4)	(6.1)	(3.2)	(1.8)	(5.8)	(3.4)	(5.4)
	Change		*(1.5)*	*(2.8)*	*(4.4)*	*0.3*	*(0.0)*	*(2.9)*	*(4.3)*	*(0.3)*	*(2.6)*	*(0.7)*
	Naphtha	(2.7)	(2.3)	(1.3)	0.4	0.2	(1.6)	0.8	(0.4)	1.3	0.6	(0.9)
	Change		*(0.4)*	*(1.4)*	*(3.1)*	*(2.9)*	*(1.1)*	*(3.5)*	*(2.3)*	*(4.0)*	*(3.3)*	*(1.8)*
Refining Margin	**Simple(단순)**	1.8	2.7	3.5	3.5	2.0	2.7	4.1	3.8	1.9	3.2	2.3
	Change		*(0.9)*	*(1.6)*	*(1.7)*	*(0.1)*	*(0.9)*	*(2.3)*	*(2.0)*	*(0.1)*	*(1.3)*	*(0.4)*
	Complex(복합)	7.4	8.0	8.3	7.7	7.8	8.0	9.4	8.3	7.0	8.0	7.5
	Change		*(0.6)*	*(0.9)*	*(0.3)*	*(0.4)*	*(0.6)*	*(2.0)*	*(0.9)*	*0.4*	*(0.6)*	*(0.1)*
	Complex(lagging)	9.3	10.4	9.4	8.0	13.3	5.0	10.9	18.0	8.5	8.9	8.9
	Change		*(1.1)*	*(0.1)*	*1.3*	*(3.9)*	*4.3*	*(1.6)*	*(8.7)*	*0.8*	*0.4*	*0.4*

자료 : Petronet, SK증권
참고 1) Crude Oil 가격은 현물(spot) 기준으로 선물(future) 가격과 다를 수 있음
참고 2) Gasoline은 95RON, 경유는 L/P 0.5%, Bunker-C는 380cst/4.0% 기준임

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Petrochemical Price Data

Daily Price			08/27	08/24	08/23	08/22	08/21	08/20	08/17	08/16	08/15	08/14
Spot Price	**Naphtha**	CFR Japan	659.5	660.0	655.6	643.0	643.0	639.0	636.8	637.3	644.3	647.5
	Ethylene	CFR SE Asia	1,270.0	1,270.0	1,270.0	1,260.0	1,260.0	1,260.0	1,260.0	1,260.0	1,260.0	1,260.0
	Propylene	FOB Korea	1,095.0	1,095.0	1,100.0	1,100.0	1,100.0	1,100.0	1,100.0	1,100.0	1,090.0	1,090.0
	Butadiene	FOB Korea	1,750.0	1,750.0	1,750.0	1,715.0	1,715.0	1,715.0	1,715.0	1,720.0	1,735.0	1,735.0
	HDPE	CFR FE Asia	1,290.0	1,290.0	1,290.0	1,290.0	1,290.0	1,300.0	1,300.0	1,300.0	1,300.0	1,300.0
	LDPE	CFR FE Asia	1,120.0	1,120.0	1,130.0	1,130.0	1,130.0	1,140.0	1,140.0	1,140.0	1,140.0	1,140.0
	LLDPE	CFR FE Asia	1,100.0	1,100.0	1,100.0	1,100.0	1,100.0	1,120.0	1,120.0	1,120.0	1,120.0	1,120.0
	MEG	CFR China	935.0	939.0	936.0	933.0	933.0	925.0	908.0	900.0	903.0	914.0
	PP	CFR FE Asia	1,210.0	1,210.0	1,220.0	1,230.0	1,230.0	1,220.0	1,220.0	1,230.0	1,230.0	1,235.0
	PX	CFR China	1,250.7	1,226.7	1,220.0	1,204.7	1,204.7	1,198.7	1,179.0	1,165.3	1,139.3	1,132.8
	PTA	CFR China	990.0	990.0	985.0	985.0	985.0	970.0	960.0	940.0	930.0	917.0
	Benzene	FOB Korea	883.7	887.0	881.3	877.3	877.3	877.3	880.3	884.7	892.3	894.3
	Toluene	FOB Korea	795.5	793.5	788.5	787.0	787.0	783.0	777.0	782.0	785.0	788.0
	Xylene	FOB Korea	945.5	945.5	949.5	938.0	938.0	938.0	924.0	923.0	901.0	895.0
	SM	FOB Korea	1,392.0	1,396.0	1,408.0	1,410.0	1,410.0	1,413.0	1,415.5	1,409.0	1,420.0	1,438.0

Weekly Price			Last Week	1W	1M	3M	6M	12M	YTD	2016avg.	2017avg.	2018acc.
Spot Price	**Naphtha**	CFR Japan	659.0	634.5	672.0	684.5	631.0	474.0	484.5	399.5	493.5	622.5
	Change, %			3.9	(1.9)	(3.7)	4.4	39.0	36.0	65.0	33.5	5.9
	Ethylene	CFR SE Asia	1,255.0	1,275.0	1,232.5	1,175.0	1,215.0	1,185.0	990.0	1,040.9	1,090.9	1,241.0
	Change, %			(1.6)	1.8	6.8	3.3	5.9	26.8	20.6	15.0	1.1
	Propylene	CFR SE Asia	1,042.5	1,047.5	995.0	1,032.5	990.0	790.0	815.0	705.7	823.6	1,059.5
	Change, %			(0.5)	4.8	1.0	5.3	32.0	27.9	47.7	26.6	(1.6)
	Butadiene	CFR SE Asia	1,700.0	1,675.0	1,625.0	1,750.0	1,410.0	1,325.0	2,100.0	1,116.8	1,481.1	1,482.6
	Change, %			1.5	4.6	(2.9)	20.6	28.3	(19.0)	52.2	14.8	14.7
	Benzene	CFR SE Asia	887.5	890.0	847.5	855.0	840.0	795.0	822.5	646.7	838.8	867.9
	Change, %			(0.3)	4.7	3.8	5.7	11.6	7.9	37.2	5.8	2.3
	Toluene	CFR SE Asia	815.0	820.0	800.0	825.0	760.0	655.0	690.0	630.5	689.5	775.6
	Change, %			(0.6)	1.9	(1.2)	7.2	24.4	18.1	29.3	18.2	5.1
	Xylene	CFR SE Asia	860.0	845.0	822.5	835.0	770.0	627.5	675.0	627.7	668.8	791.5
	Change, %			1.8	4.6	3.0	11.7	37.1	27.4	37.0	28.6	8.6
Spread	**Ethylene**	-Naphtha	596.0	640.5	560.5	490.5	584.0	711.0	505.5	641.4	597.4	618.5
	Change, %			(6.9)	6.3	21.5	2.1	(16.2)	17.9	(7.1)	(0.2)	(3.6)
	Propylene	-Naphtha	383.5	413.0	323.0	348.0	359.0	316.0	330.5	306.2	330.1	437.0
	Change, %			(7.1)	18.7	10.2	6.8	21.4	16.0	25.3	16.2	(12.2)
	Butadiene	-Naphtha	1,041.0	1,040.5	953.0	1,065.5	779.0	851.0	1,615.5	717.3	987.6	860.2
	Change, %			0.0	9.2	(2.3)	33.6	22.3	(35.6)	45.1	5.4	21.0
	Benzene	-Naphtha	228.5	255.5	175.5	170.5	209.0	321.0	338.0	247.2	345.3	245.5
	Change, %			(10.6)	30.2	34.0	9.3	(28.8)	(32.4)	(7.6)	(33.8)	(6.9)
	Toluene	-Naphtha	156.0	185.5	128.0	140.5	129.0	181.0	205.5	231.0	196.0	153.1
	Change, %			(15.9)	21.9	11.0	20.9	(13.8)	(24.1)	(32.5)	(20.4)	1.9
	Xylene	-Naphtha	201.0	210.5	150.5	150.5	139.0	153.5	190.5	228.2	175.3	169.1
	Change, %			(4.5)	33.6	33.6	44.6	30.9	5.5	(11.9)	14.6	18.9

자료 : Cischem, Platts, Bloomberg, SK증권
참고 : Spread는 Polymer와 Naphtha의 가격차이임

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Weekly Price			Last Week	1W	1M	3M	6M	12M	YTD	2016avg.	2017avg.	2018acc.
Spot Price	**HDPE**	CFR SE Asia	1,212.5	1,217.5	1,227.5	1,312.5	1,252.5	1,107.5	1,142.5	1,134.6	1,142.5	1,250.8
	Change, %			*(0.4)*	*(1.2)*	*(7.6)*	*(3.2)*	*9.5*	*6.1*	*6.9*	*6.1*	*(3.1)*
	MEG	CFR SE Asia	955.0	922.5	955.0	950.0	1,020.0	902.5	847.5	660.8	850.6	972.4
	Change, %			*3.5*	*0.0*	*0.5*	*(6.4)*	*5.8*	*12.7*	*44.5*	*12.3*	*(1.8)*
	PVC	CFR SE Asia	950.0	950.0	945.0	920.0	940.0	920.0	920.0	823.4	899.9	942.9
	Change, %			*0.0*	*0.5*	*3.3*	*1.1*	*3.3*	*3.3*	*15.4*	*5.6*	*0.8*
	PP	CFR SE Asia	1,232.5	1,232.5	1,232.5	1,297.5	1,242.5	1,117.5	1,032.5	978.4	1,099.6	1,256.3
	Change, %			*0.0*	*0.0*	*(5.0)*	*(0.8)*	*10.3*	*19.4*	*26.0*	*12.1*	*(1.9)*
	2-EH	CFR Korea	1,130.0	1,130.0	1,095.0	1,180.0	1,140.0	990.0	865.0	772.4	970.0	1,116.5
	Change, %			*0.0*	*3.2*	*(4.2)*	*(0.9)*	*14.1*	*30.6*	*46.3*	*16.5*	*1.2*
	ABS	CFR SE Asia	1,920.0	1,960.0	1,940.0	2,080.0	1,990.0	1,895.0	1,635.0	1,347.1	1,844.7	2,011.9
	Change, %			*(2.0)*	*(1.0)*	*(7.7)*	*(3.5)*	*1.3*	*17.4*	*42.5*	*4.1*	*(4.6)*
	SBR	CFR SE Asia	1,875.0	1,875.0	1,760.0	1,890.0	1,700.0	1,650.0	2,000.0	1,483.0	1,980.5	1,763.5
	Change, %			*0.0*	*6.5*	*(0.8)*	*10.3*	*13.6*	*(6.3)*	*26.4*	*(5.3)*	*6.3*
	SM	CFR SE Asia	1,440.0	1,470.0	1,395.0	1,440.0	1,355.0	1,242.5	1,205.0	1,064.6	1,253.8	1,407.5
	Change, %			*(2.0)*	*3.2*	*0.0*	*6.3*	*15.9*	*19.5*	*35.3*	*14.9*	*2.3*
	Caustic	FOB NEA	421.0	421.0	361.0	560.0	598.0	471.0	422.5	316.6	491.2	537.6
	Change, %			*0.0*	*16.6*	*(24.8)*	*(29.6)*	*(10.6)*	*(0.4)*	*33.0*	*(14.3)*	*(21.7)*
	PX	CFR SE Asia	1,235.0	1,185.0	1,032.5	1,012.5	977.5	817.5	855.0	790.4	844.4	992.4
	Change, %			*4.2*	*19.6*	*22.0*	*26.3*	*51.1*	*44.4*	*56.3*	*46.2*	*24.5*
	PO	CFR China	1,905.0	1,870.0	1,782.5	1,737.5	1,935.0	1,992.5	1,562.5	1,396.8	1,601.2	1,866.3
	Change, %			*1.9*	*6.9*	*9.6*	*(1.6)*	*(4.4)*	*21.9*	*36.4*	*19.0*	*2.1*
	Caprolactam	CFR SE Asia	2,160.0	2,155.0	2,155.0	2,100.0	2,170.0	1,770.0	1,850.0	1,344.9	1,936.4	2,127.2
	Change, %			*0.2*	*0.2*	*2.9*	*(0.5)*	*22.0*	*16.8*	*60.6*	*11.5*	*1.5*
	PTA	CFR SE Asia	990.0	972.5	862.5	850.0	802.5	657.5	642.5	613.7	667.8	825.1
	Change, %			*1.8*	*14.8*	*16.5*	*23.4*	*50.6*	*54.1*	*61.3*	*48.2*	*20.0*
Spread	**HDPE**		553.5	583.0	555.5	628.0	621.5	633.5	658.0	735.1	649.0	628.3
	Change, %			*(5.1)*	*(0.4)*	*(11.9)*	*(10.9)*	*(12.6)*	*(15.9)*	*(24.7)*	*(14.7)*	*(11.9)*
	MEG		296.0	288.0	283.0	265.5	389.0	428.5	363.0	261.3	357.1	349.9
	Change, %			*2.8*	*4.6*	*11.5*	*(23.9)*	*(30.9)*	*(18.5)*	*13.3*	*(17.1)*	*(15.4)*
	PVC		291.0	315.5	273.0	235.5	309.0	446.0	435.5	423.9	406.4	320.4
	Change, %			*(7.8)*	*6.6*	*23.6*	*(5.8)*	*(34.8)*	*(33.2)*	*(31.3)*	*(28.4)*	*(9.2)*
	PP		573.5	598.0	560.5	613.0	611.5	643.5	548.0	578.9	606.1	633.8
	Change, %			*(4.1)*	*2.3*	*(6.4)*	*(6.2)*	*(10.9)*	*4.7*	*(0.9)*	*(5.4)*	*(9.5)*
	2-EH		471.0	495.5	423.0	495.5	509.0	516.0	380.5	372.9	476.5	494.0
	Change, %			*(4.9)*	*11.3*	*(4.9)*	*(7.5)*	*(8.7)*	*23.8*	*26.3*	*(1.2)*	*(4.7)*
	ABS		1,261.0	1,325.5	1,268.0	1,395.5	1,359.0	1,421.0	1,150.5	947.6	1,351.2	1,389.4
	Change, %			*(4.9)*	*(0.6)*	*(9.6)*	*(7.2)*	*(11.3)*	*9.6*	*33.1*	*(6.7)*	*(9.2)*
	SBR	BD spread	175.0	200.0	135.0	140.0	290.0	325.0	(100.0)	366.2	499.4	280.9
	Change, %			*(12.5)*	*29.6*	*25.0*	*(39.7)*	*(46.2)*	*(275.0)*	*(52.2)*	*(65.0)*	*(37.7)*
	SM		781.0	835.5	723.0	755.5	724.0	768.5	720.5	665.1	760.3	785.0
	Change, %			*(6.5)*	*8.0*	*3.4*	*7.9*	*1.6*	*8.4*	*17.4*	*2.7*	*(0.5)*
	Caustic											
	Change, %											
	PX		576.0	550.5	360.5	328.0	346.5	343.5	370.5	390.9	351.0	369.9
	Change, %			*4.6*	*59.8*	*75.6*	*66.2*	*67.7*	*55.5*	*47.4*	*64.1*	*55.7*
	PO	propylene sprea	862.5	822.5	787.5	705.0	945.0	1,202.5	747.5	691.1	777.6	806.8
	Change, %			*4.9*	*9.5*	*22.3*	*(8.7)*	*(28.3)*	*15.4*	*24.8*	*10.9*	*6.9*
	Caprolactam	benzene spreac	1,272.5	1,265.0	1,307.5	1,245.0	1,330.0	975.0	1,027.5	698.2	1,097.6	1,259.3
	Change, %			*0.6*	*(2.7)*	*2.2*	*(4.3)*	*30.5*	*23.8*	*82.3*	*15.9*	*1.1*
	PTA	px spread	125.5	143.0	139.8	141.3	118.3	85.3	44.0	60.4	76.7	130.4
	Change, %			*(12.2)*	*(10.2)*	*(11.2)*	*6.1*	*47.2*	*185.2*	*107.7*	*63.6*	*(3.8)*

자료 : Cischem, Platts, SK증권

참고 : Spread는 Naphtha spread로 일괄적용

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Global peers

	Currency	08/27	1D	1W	1M	3M	6M	12M	YTD	MKT CAP (mil USD)	PER 18E	PER 19E	PBR 18E	PBR 19E	EV/EBITDA 18E	EV/EBITDA 19E
Petrochemical																
DowDuPont	USD	70.8	2.3	3.4	3.6	7.8	(2.1)	9.7	(0.6)	168,245	17.7	14.9	1.8	1.7	10.2	9.2
Eastman	USD	99.9	0.9	1.8	(1.0)	(6.0)	(2.4)	17.7	7.8	13,550	11.6	10.7	2.5	2.2	8.7	8.1
BASF	EUR	80.9	1.6	2.8	(1.6)	(7.5)	(7.1)	(1.5)	(11.8)	101,214	14.6	13.6	2.4	2.2	7.8	7.4
Akzo Nobel	EUR	80.1	0.7	0.7	1.2	3.6	0.2	2.4	9.8	22,073	17.0	15.8	3.0	2.8	9.3	8.8
Arkema	EUR	107.9	0.6	1.4	1.2	1.1	(0.5)	15.7	6.2	9,270	13.2	12.2	1.7	1.6	6.3	6.0
Lanxess	EUR	69.9	1.7	2.6	(0.1)	0.5	0.7	7.3	5.4	7,282	15.5	13.1	2.1	1.9	9.3	8.2
Sumitomo Chemical	JPY	638	2.4	4.2	(1.1)	(2.7)	(5.8)	(3.0)	(21.2)	11,911	10.1	10.5	1.3	1.2	7.4	8.0
Mitsubishi Chemical	JPY	994	2.0	4.7	(0.0)	(2.5)	(10.9)	(0.9)	(19.6)	16,544	9.2	8.7	1.3	1.2	6.3	6.1
Shin-Etsu Chemical	JPY	10,710	1.1	3.2	(5.4)	(5.3)	(7.2)	11.5	(6.5)	43,948	18.5	16.6	1.9	1.8	8.1	7.4
Asahi Kasei	JPY	1,621	2.0	3.0	9.3	9.7	16.9	28.2	11.5	18,109	14.4	13.6	1.5	1.4	7.4	7.0
JSR	JPY	2,190	2.1	4.3	7.2	2.1	(12.7)	3.5	(1.3)	4,455	14.5	13.4	1.2	1.1	7.7	7.2
Nitto Denko	JPY	8,366	0.7	(0.3)	3.3	(3.4)	(7.1)	(13.3)	(16.4)	15,450	15.7	14.6	2.1	1.9	7.3	7.0
SABIC	SAR	125.4	0.2	2.0	(3.4)	3.6	19.2	27.3	23.6	80,773	14.2	13.7	1.7	1.7	7.3	7.1
Yansab	SAR	72.5	(0.7)	0.1	(2.8)	1.3	7.3	29.9	22.9	8,861	13.7	13.9	2.2	1.9	9.0	8.9
Formosa Plastics	TWD	113.5	0.9	4.1	2.7	4.6	9.7	20.9	15.0	21,114	14.4	13.9	1.8	1.8	18.9	19.2
Formosa Fiber	TWD	123.5	1.6	5.1	4.2	7.4	13.8	31.7	19.9	20,511	13.7	13.4	1.7	1.7	11.6	11.5
Nan Ya Plastics	TWD	84.8	0.5	2.0	0.8	(1.4)	5.2	12.6	8.9	20,648	14.8	15.3	1.7	1.7	16.2	16.4
Sinopec Shanghai	CNY	5.39	2.3	3.7	0.9	(9.1)	(9.9)	(16.2)	(14.8)	9,462	12.0	12.6	2.2	2.0	6.8	7.3
Sinopec Yizheng(Fibe	CNY	2.01	0.5	5.8	3.6	(8.2)	(12.6)	(37.2)	(24.7)	5,394	50.4	66.3	5.3	5.0	13.9	10.3
Reliance	INR	1,292	1.1	4.6	14.3	40.3	35.9	64.7	42.0	93,404	14.4	12.9	1.7	1.5	9.4	8.7
Industries Qatar	QAR	124.7	3.1	4.3	3.0	17.6	15.5	35.3	28.6	16,144	14.5	13.9	1.6	1.5	46.4	27.2
PTT Chemical	THB	80.8	0.3	(0.9)	(0.9)	(11.5)	(18.6)	9.1	(5.0)	11,766	10.7	10.4	1.4	1.3	5.5	5.4
Petronas	MYR	9.5	1.4	0.6	7.5	14.2	17.0	32.3	23.4	15,624	16.1	15.5	2.0	1.9	9.2	8.9
LG화학	KRW	372,000	1.6	1.6	(0.7)	5.5	(6.5)	0.9	(8.1)	27,313	13.8	12.8	1.8	1.6	6.5	6.1
롯데케미칼	KRW	311,000	(0.2)	(8.0)	(11.8)	(15.3)	(33.3)	(20.1)	(15.5)	11,632	5.5	5.2	0.9	0.8	3.6	3.3
한화케미칼	KRW	19,600	0.0	(4.9)	(8.0)	(26.0)	(41.7)	(45.1)	(38.0)	5,050	5.7	5.5	0.8	0.7	6.7	6.5
금호석유	KRW	101,000	(1.5)	1.6	(6.9)	(1.9)	8.3	31.2	1.5	2,969	14.1	11.9	1.6	1.5	9.3	8.4
SKC	KRW	45,900	0.3	(1.1)	4.1	18.0	18.1	22.4	(2.3)	1,643	9.9	8.7	1.1	1.0	8.8	7.9
국도화학	KRW	58,200	(0.2)	0.3	6.2	(8.2)	(3.5)	7.8	(7.8)	359	#N/A N/A	#N/A N/A	#N/A N/A	#N/A N/A	#N/A N/A	#N/A N/A
효성	KRW	6,460	1.6	3.2	4.5	(2.9)	(33.6)	(10.3)	(14.8)	4,595	8.2	7.3	1.1	1.0	7.2	6.8
Average			**1.0**	**1.9**	**1.1**	**0.8**	**(1.6)**	**9.2**	**0.6**							
Refinery																
Valero	USD	121.2	0.5	6.9	4.2	2.1	30.7	79.1	31.9	40,608	14.1	13.4	2.0	2.0	6.9	6.9
Conoco Phillips	USD	72.8	0.3	3.3	1.9	11.3	30.5	67.1	32.7	66,136	34.0	25.9	2.2	2.2	7.2	6.7
Formosa Petrochemic	TWD	128.0	0.8	3.6	6.7	4.5	9.4	21.9	10.8	37,040	18.2	18.7	3.2	3.2	11.7	12.1
Andeavor	USD	155.4	0.1	5.3	3.4	10.1	66.0	62.7	35.9	17,904	12.9	11.4	1.8	1.7	7.3	7.1
Marathon Petroleum	USD	83.7	(0.2)	6.2	3.3	8.7	27.6	61.8	26.8	32,812	15.0	12.8	2.6	2.7	7.7	7.5
Devon Energy	USD	42.9	0.5	4.5	(3.7)	5.7	34.6	37.6	3.6	22,192	17.5	14.0	2.7	2.3	8.4	7.4
Hollyfrontier	USD	73.9	0.4	4.5	(0.2)	1.7	66.4	150.0	44.3	9,094	16.8	15.2	1.8	1.8	8.0	8.0
Phillips 66	USD	120.0	0.7	3.4	1.0	3.8	30.3	43.9	18.7	51,561	15.6	14.5	2.3	2.2	9.0	8.8
Murphy Oil	USD	31.2	(0.6)	4.6	(3.2)	6.6	21.3	34.9	0.6	5,548	162.4	113.2	1.2	1.1	4.9	4.5
JX Holdings	JPY	793.1	2.0	5.1	(4.3)	10.7	16.7	46.1	9.1	22,130	8.8	8.0	0.9	0.9	7.0	6.6
Idemitsu	JPY	5,540.0	2.0	6.3	8.6	44.5	32.1	103.8	22.4	8,360	7.9	7.5	1.0	0.9	6.8	6.8
Nesteoil	EUR	74.8	0.3	2.2	6.0	11.6	23.2	108.8	40.1	16,473	16.7	16.7	2.9	2.7	10.2	10.3
Ashland	USD	85.2	0.5	1.0	3.2	7.9	17.9	38.7	19.7	4,550	21.6	18.7	1.3	1.3	10.2	9.6
Fuchs Petrolub	EUR	50.1	0.9	1.9	12.4	8.0	6.3	5.9	13.2	7,127	22.1	20.9	4.1	3.7	13.0	12.3
SK이노베이션	KRW	197,000	(0.3)	(1.5)	(0.8)	(2.5)	(4.8)	9.1	(3.7)	17,975	7.9	7.7	0.9	0.9	4.9	4.8
S-Oil	KRW	122,000	(0.8)	(2.8)	8.0	11.9	(0.8)	4.3	4.3	12,400	9.3	8.1	1.8	1.6	7.6	6.6
GS	KRW	54,000	0.7	(0.4)	2.5	(8.8)	(18.4)	(20.7)	(13.2)	5,467	6.0	5.5	0.7	0.6	6.9	6.3
Average			**0.5**	**3.2**	**2.9**	**8.1**	**22.9**	**50.3**	**17.5**							

* Bloomberg 기준 / valuation multiple 또한 Bloomberg consensus 기준임

* 국내업체의 multiple은 Dataguidepro 기준임

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Global peers

	Currency	08/27	1D	1W	1M	3M	6M	12M	YTD	MKT CAP (mil USD)	PER 18E	PER 19E	PBR 18E	PBR 19E	EV/EBITDA 18E	EV/EBITDA 19E
E&P/Shale																
Exxon Mobil	USD	80	1.0	2.0	(1.9)	2.1	3.7	4.8	(3.9)	340,398	17.2	14.7	1.8	1.7	7.8	6.8
BP	GBP	564	0.0	2.1	(0.6)	1.5	17.9	26.5	7.8	144,719	13.2	11.9	1.4	1.4	5.1	4.7
Shell	EUR	2,564	0.0	3.0	(1.4)	0.2	11.3	19.6	3.4	276,593	12.2	10.4	1.4	1.3	5.7	5.3
Chevron	USD	120	1.1	2.2	(4.5)	(1.5)	5.9	11.2	(3.9)	230,608	15.2	13.9	1.5	1.5	6.3	5.8
Total	EUR	55	1.0	4.8	0.8	8.5	17.2	27.9	20.4	172,691	12.1	10.9	1.4	1.3	5.9	5.4
Sinopec	CNY	7	2.9	5.6	3.0	(2.0)	4.0	13.1	11.3	121,157	10.5	10.0	1.1	1.0	4.0	3.9
Petrochina	CNY	8	1.6	1.0	9.0	1.6	1.6	2.4	2.1	212,107	25.3	20.9	1.2	1.2	5.6	5.4
CNOOC	CNY	11	1.3	4.1	14.7	(3.1)	(2.4)	(5.3)	1.7	77,466	9.5	8.9	1.3	1.2	3.7	3.6
Gazprom	RUB	145	0.6	2.1	4.7	(0.4)	(1.4)	22.6	10.7	50,936	3.1	3.2	0.2	0.2	2.5	2.5
Rosneft	RUB	435	1.6	1.8	7.7	14.9	28.8	44.2	49.1	68,597	8.2	6.7	1.0	0.9	4.7	4.4
Anadarko	USD	65	1.4	3.6	(10.8)	(4.5)	10.4	52.4	20.3	33,054	21.9	15.9	2.7	2.3	6.4	5.5
Petrobras	BRL	19	2.2	1.9	(5.4)	(5.5)	(13.0)	34.8	16.2	64,860	6.9	5.8	0.7	0.6	4.5	4.1
Lukoil	USD	4,577	1.7	4.4	3.4	7.7	19.2	57.0	37.3	56,562	5.6	5.7	0.8	0.7	N/A	N/A
Kinder	USD	18	0.0	0.3	0.4	13.1	8.0	(6.3)	(0.6)	47,497	22.8	18.2	1.2	1.2	10.6	10.5
Equinor ASA	NOK	218	1.2	0.9	2.2	6.0	19.4	49.2	24.4	87,459	13.3	12.3	2.0	1.8	3.5	3.2
BHP	AUD	33	1.1	(0.3)	(3.8)	0.0	6.3	24.0	11.9	123,392	13.8	15.3	2.3	2.2	6.2	6.5
PTT E&P	THB	141	1.1	4.1	2.2	0.4	20.5	64.9	41.0	17,211	13.6	12.5	1.4	1.3	4.4	4.0
Petronas gas	MYR	19	1.6	3.5	(1.1)	4.3	5.0	(0.4)	7.6	9,085	19.6	19.5	2.8	2.7	10.7	10.7
Chesapeake	USD	5	(0.2)	3.2	3.4	6.0	49.0	20.3	15.2	4,160	5.9	5.9	#N/A N/A	7.0	6.6	6.5
Noble Energy	USD	30	2.8	5.4	(14.1)	(14.1)	0.6	28.4	4.2	14,667	27.5	22.0	1.4	1.3	7.2	6.2
Average		**0**	**1.2**	**2.8**	**0.4**	**1.8**	**10.6**	**24.6**	**13.8**							
PV																
WACKER	EUR	126.8	0.8	3.4	4.8	(15.0)	(9.0)	18.8	(21.8)	7,729	18.1	16.2	2.0	1.9	6.8	6.5
GCL-Poly	HKD	0.5	1.9	0.0	(22.9)	(41.9)	(56.8)	(39.3)	(61.4)	1,263	5.0	4.3	0.4	0.3	6.4	5.9
SunPower	USD	6.8	(0.4)	(2.0)	(1.9)	(23.2)	(7.0)	(26.4)	(19.8)	953	#N/A N/A	#N/A N/A	96.6	965.7	16.6	10.4
Canadian Solar	USD	13.9	0.6	6.2	5.8	(16.4)	(10.2)	(9.9)	(17.3)	817	9.7	9.8	0.8	0.7	6.7	7.5
JA Solar	USD	7.5	0.0	0.0	0.0	3.5	1.6	17.4	0.4	356	#N/A N/A	#N/A N/A	1.8	2.0	4.9	7.1
Yingli	USD	0.3	(6.7)	(6.7)	(31.7)	(83.4)	(83.3)	(88.9)	(83.4)	5	#N/A N/A	#N/A N/A	#N/A N/A	#N/A N/A	#N/A N/A	#N/A N/A
First Solar	USD	52.6	1.0	0.6	1.9	(22.9)	(17.1)	10.9	(22.1)	5,514	32.3	17.0	1.0	1.0	8.0	4.2
한화큐셀	USD	8.4	0.6	0.7	29.0	16.2	(0.8)	13.2	19.7	699	15.0	31.1	#N/A N/A	#N/A N/A	8.8	9.1
OCI	KRW	115,000	5.0	0.4	13.3	(19.3)	(31.8)	20.0	(15.4)	2,476	0.0	12.9	0.0	0.8	0.0	5.6
웅진에너지	KRW	2,960	(0.3)	(4.1)	(6.6)	(44.4)	(60.6)	(66.0)	(64.0)	79	N/A	0.0	0.8	0.0	5.6	0.0
신성솔라에너지	KRW	1,370	(1.1)	(1.8)	4.6	(18.9)	(25.1)	(36.9)	(28.5)	214	N/A	0.8	0.0	5.6	0.0	2.2
Average			**0.1**	**(0.3)**	**(0.3)**	**(24.2)**	**(27.3)**	**(17.0)**	**(28.5)**							
Gas Company																
Towngas China	HKD	7.4	5.0	8.8	(5.5)	(6.4)	18.0	45.0	18.0	2,653	14.4	12.8	1.2	1.1	12.9	11.7
Kulun	HKD	7.5	3.2	7.6	8.9	0.4	(0.5)	4.6	(8.4)	7,671	10.8	9.4	1.2	1.1	6.3	5.6
Beijing Enterprise	HKD	36.2	2.0	3.4	(6.3)	(15.6)	(17.6)	(11.5)	(22.1)	5,812	6.3	5.7	0.6	0.6	11.5	11.0
ENN Energy	HKD	77.7	5.1	4.9	(3.1)	(0.7)	28.9	59.1	39.3	11,132	17.1	14.6	3.6	3.1	10.8	9.5
China Resources Gas	HKD	36.3	1.8	3.4	0.0	21.4	35.7	35.7	28.0	10,284	17.8	15.8	3.1	2.8	9.9	8.9
China Gas Holdings	HKD	26.0	2.0	0.6	(21.2)	(17.6)	6.1	40.4	20.1	16,788	16.6	14.1	3.9	3.2	13.3	11.3
Shenzen Gas	HKD	14.8	4.2	6.6	(1.6)	(14.6)	(8.2)	(0.8)	(0.7)	3,971	9.2	7.7	1.2	1.1	7.5	6.7
Shann Xi	CNY	7.3	2.1	1.7	(2.7)	(8.0)	(1.1)	(15.3)	(13.9)	1,184	16.8	14.8	1.4	1.3	#N/A N/A	#N/A N/A
Suntien	HKD	2.2	(0.9)	(0.5)	(12.1)	(19.3)	15.4	28.4	4.8	1,027	5.6	5.0	0.7	0.7	8.1	7.0
China Oil & Gas	HKD	0.6	0.0	5.0	5.0	5.0	(7.4)	18.9	(25.9)	469	#N/A N/A	#N/A N/A	#N/A N/A	#N/A N/A	#N/A N/A	#N/A N/A
Average			**2.4**	**4.2**	**(3.9)**	**(5.5)**	**6.9**	**20.5**	**3.9**							
EV																
LG화학	KRW	372,000	1.6	1.6	(0.7)	5.5	(6.5)	0.9	(8.1)	23,707	14.2	12.8	1.6	1.5	6.9	6.2
삼성SDI	KRW	233,000	4.0	12.0	(0.6)	12.6	32.8	22.0	13.9	14,464	22.0	15.7	1.4	1.3	13.7	10.8
Panasonic	JPY	1347.0	0.1	(1.0)	(6.1)	(11.4)	(20.6)	(7.4)	(18.3)	29,755	12.2	10.8	1.7	1.5	4.9	4.5
GS Yuasa	JPY	518.0	2.2	3.8	0.6	(1.7)	(13.7)	(1.7)	(7.7)	1,929	15.6	14.4	1.1	1.1	7.0	6.5
NEC	JPY	3000.0	0.0	1.9	(3.2)	(0.5)	(8.1)	2.7	(1.3)	7,037	22.7	12.4	0.9	0.8	7.5	5.5
BYD Auto	CNY	45.0	3.6	(0.5)	4.7	(17.0)	(29.1)	(7.5)	(30.8)	17,732	28.6	21.3	2.1	2.0	13.2	11.3
Tesla Motors	USD	319.3	(1.1)	3.5	7.4	14.5	(9.0)	(8.3)	2.5	54,465	#N/A N/A	98.3	9.6	9.1	41.0	18.6
Kandi Technologies	USD	4.0	0.0	0.0	(1.2)	(29.8)	(27.9)	12.7	(41.2)	206	#N/A N/A	#N/A N/A	#N/A N/A	#N/A N/A	#N/A N/A	#N/A N/A
Average			**1.3**	**2.7**	**0.1**	**(3.5)**	**(10.3)**	**1.7**	**(11.4)**							

* Bloomberg 기준 / valuation multiple 또한 Bloomberg consensus 기준임