IHS Markit®

Four Key Trends Impacting the Refining and Chemical Industries

Start

Refining Industry Drivers

Trend #1:

NOCs will continue to expand in refining, IOCs will continue to shrink their portfolio; European refining rationalization would temporarily pause as margins are expected to improve vastly after 2019 owing to impact of IMO 2020 rollout; non-traditional operators, i.e. Traders and financial players, are expected to remain active and pick up some more downstream assets.

How can CSP help with monitoring this issue?

Trend #2:

IOCs realigning their strategy for emerging markets, while NOCs, which have lower flexibility, are challenged to cope with changing regulations in these markets and financial pressures.

How can CSP help with monitoring this issue?

Trend #3:

Remarkable performance for downstream globally in 2016; healthy earnings expected in 2018 as well, in line with the improving demand and strengthening margin outlook. However, rising crude oil prices can play spoilsport.

How can CSP help with monitoring this issue?

Trend #4:

Despite the strong balance sheet, limited downstream capex spending is expected in the next few years by IOCs/ROCs as crude prices have strengthened, providing impetus to upstream investments.

How can CSP help with monitoring this issue?

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Chemical Industry Drivers

Trend #1:

Increasing competition from new participants, and increased M&A activities in North America - possibly the biggest lever exploited by companies to increase value generation, cost efficiencies and market share.

How CSP helps with monitoring this issue?

Trend #2:

Growth markets in Asia are characterized by higher cash cost position and face stiff competition from feedstock-advantaged regions.

How CSP helps with monitoring this issue?

Trend #3:

Middle East producers' competitive position has shifted with increase in global competition. Historically, the discounted ethane supply has allowed the petrochemical industry in the region to become highly competitive but the region is now dealing with shortage of ethane allocation for new projects.

How CSP helps with monitoring this issue?

Trend #4:

Increasing investments in alternative technologies is expected to reduce dependence on steam cracking.

How CSP helps with monitoring this issue?

Coverage

Company Strategy and Performance from IHS Markit provides an in-depth comparative view of the strategic direction and financial position of the top 64 refining and chemical companies, globally.

Americas		EMEA		APAC	
Chemical Companies	**Refining Companies**	**Chemical Companies**	**Refining Companies**	**Chemical Companies**	**Refining Companies**
Braskem	Andeavor	AkzoNobel	BP	Asahi Glass Co.	Indian Oil
ChevronPhillips Chemical Co	Chevron	BASF SE	ENI SpA	China National Salt Industries	JXTG
DowDupont	Citgo	BP	KPC	CNPC	PetroChina
ExxonMobil	Delek	ENI SpA	Lukoil	Formosa	Pertamina
LyondellBasell	ExxonMobil	INEOS	MOL	Mitsubishi	Petronas
Mexichem	HollyFrontier	Mubadala (IPIC)	OMV	Petronas	Reliance
Occidental - OxyChem	Husky	NPC-Iran	PKN Orlen	Reliance	SINOPEC
Olin	Marathon	Royal Dutch/ Shell	Repsol	Shanghai Tian Yuan	SK Energy
Westlake Chemical	PBF Energy	SABIC	Royal Dutch/Shell	Shin-Etsu	
	Petrobras	Saudi Aramco	Saudi Aramco	Siam Cement	
	Phillips 66	Total	Total	SINOPEC	
	Suncor			Sumitomo	
	Valero				

Stay Ahead

Our unique perspective of each company's performance and strategies, benchmarking of peer groups and coverage of topical issues, allows you to easily:

- Review competitive behavior and strategies
- Grasp market dynamics & key trends
- Benchmark performance & competitive position
- Support analysis required by leadership/management

Key Elements:

Global Company Profiles

Organizational, operational and portfolio structure; strategic and investment rationale; expansion and growth strategies of the top chemical producers and refiners.

View Sample

Product Level Financial Metrics

Quarterly financial performance benchmarking of EBIT, ROCE, Capex, capital employed and revenue for each company and its peer group.

View Sample

Company Perspectives

Analytical reports of key events and trends in the refining and chemical competitive landscape.

View Sample

Performance Benchmarking

An assessment of each company by peer group on operational metrics such as asset portfolio, product integration and proximity to market.

View Sample

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Chemical Industry Drivers

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Corporate snapshot

Sample Company focuses on high growth vertically integrated model across value chains

- Sample Company is a global oil and gas company. It is present across the value chain from exploration to midstream to value-added fuels and petrochemicals.
- Sample Company upstream portfolio is very diverse with investment focus on high-margin production in areas, such as in, region T, U and V along with shale and tight resource plays in country J, K, and P.
- The company has a focused and profitable refining, marketing, and chemicals portfolio, achieved through integrated refineries and petrochemical operations, taking advantage of feedstock flexibility, scale, and technology.
- Sample Company operates its chemical business through company T, a 50:50 joint venture (JV) with company R and is one of the top producers of olefins and polyolefins, one of the world's largest alpha olefins producers, and a leading supplier of aromatics, styrenics, specialty chemicals, and proprietary plastics.
- The company operates YY chemical manufacturing and research facilities worldwide, supplying products to more than XX,XXX consumer along with several industrial products.
- Sample Company's total revenue increased by YY% year on year in 2017, reaching $XXX billion, due to strengthening of crude oil prices and high margins on refined product sales.
- The company continues to streamlines its core business by divesting nonperforming and low-growth businesses and emphasizing capital allocation at selective core locations for competitive returns from its various business segments between the commodity cycles.

Sample Company Revenue and Net Income

Source: IHS Markit

Headquarters	Company information
Sample Company XXXX Rayon Manson Road Fernando, Arizona XXXXX	Size: Large Employees: XX,XXX as of 2017 DD,DDD in 2016 Geographic reach: Global Industry: Integrated Oil & Gas Type: Public

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Refining Industry Drivers

Chemical Industry Drivers

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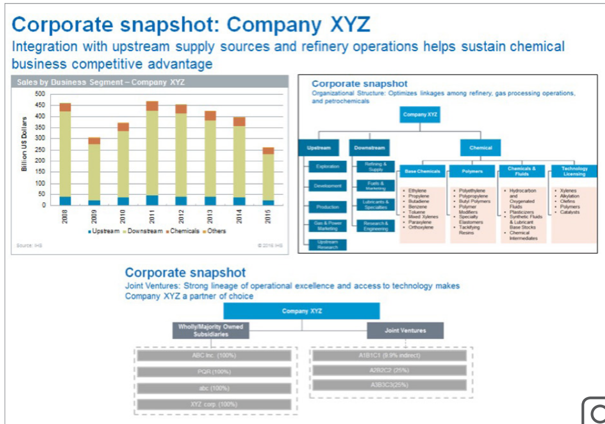
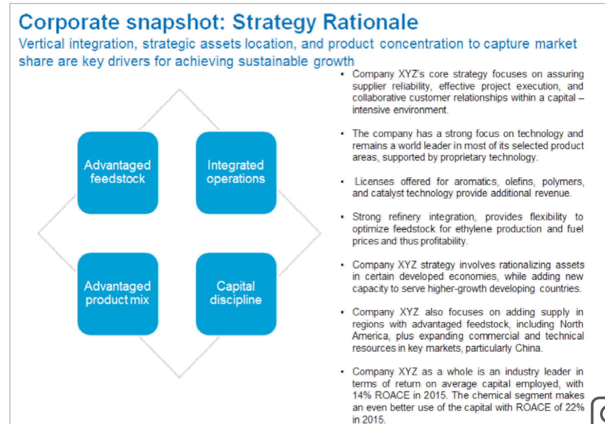
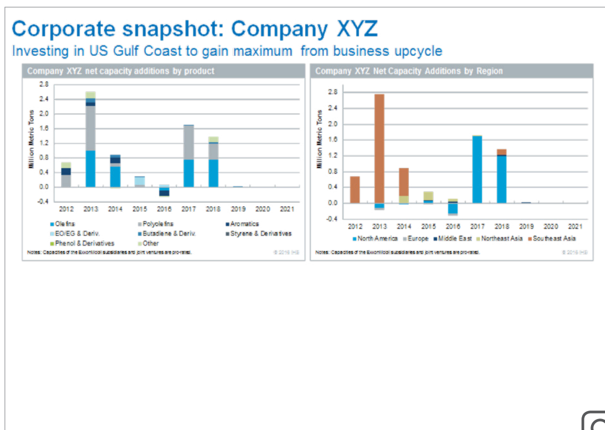
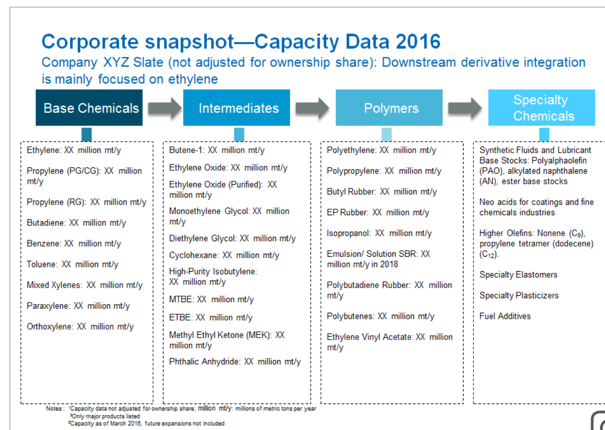
Corporate snapshot

Covers information related to organization structure, JV's, history, strategy and strategic intent, product capacity and expansion/closure









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KEY ELEMENTS

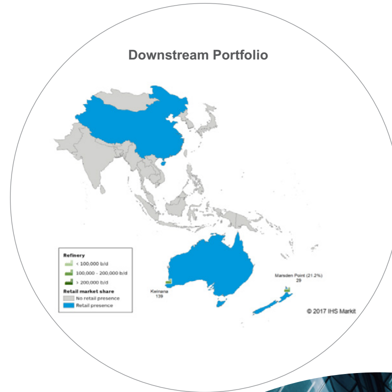
Company Profiles:
Corporate and Financial Overview

Andeavor corporate and financial overview

	2017	Change '17/'16	CSP-NA rank
Global Financial ($ bn)			
Enterprise value	28.3	71.1%	9
Market capitalization	*17.5*	*71.4%*	*9*
Net debt	*7.1*	*96.3%*	*7*
Price/earnings ratio	21.2	55.8%	7
Capital employed	18.6	39.3%	10
Of which refining & marketing	*17.7*	*81.3%*	*8*
Refining & Marketing EBITDA	2.3	35.0%	9
Of which NorAm refining & marketing	*2.3*	*35.0%*	*9*
Capital expenditures	1.2	60.3%	10
Of which refining & marketing	*1.0*	*59.7%*	*8*
NorAm Refining Operational			
Distillation capacity (1,000 b/d)	1,100	29.2%	6
Utilization rate	94.3%	2.9%	8
Conversion ratio	58.2%	-13.9%	8
IHS Markit Complexity	9.43	-5.1%	10
Site count	3,165	33.7%	8
NorAm Chemical Operational			
Olefins Capacity (mmtpa)	0.78	-	-
Base Aromatics Capacity (mmtpa)	-	-	-
Refinery-Petrochemical Integration (%)	1.7%	-	-
Refinery-Petrochemical Integration			
Total number of refineries	11	-	-
Number of refineries integrated with petrochemicals	*4*	-	-
Number of refineries integrated with steam cracker	*0*	-	-
Crude capacity linked with petrochemicals (%)	52.7%	-	-
Highest degree of refinery-petchem integration (%)	2.7% (Carson)		-

Source: IHS Markit

Note: Olefins includes ethylene and propylene; Aromatics include benzene, toluene and xylenes
*Capacity data adjusted on shareholding basis



Company Perspectives: Examples of Strategic Reports and Alerts

Philadelphia Energy Solutions Bankruptcy

12 February 2018

Troubled refinery pins hardships on RFS

Valentin Markov, Research Analyst

On 22 January, 2018, Philadelphia Energy Solutions (PES), owner of the 335,000 b/d Philadelphia refinery, announced it would file for Chapter 11 bankruptcy. Although the plant will remain in operation while the proceedings continue, the facility finds itself facing the prospect of closure for the second time in five years. PES, a joint venture between the Carlyle Group and Sunoco, was formed in 2012 after Carlyle invested in the ailing facility. Initially, the refinery enjoyed a significant tailwind from surging US crude production and the associated discount for domestic barrels, a development that nearly led to an initial public offering for PES. However, pipeline buildout in the Bakken has eliminated the economic rationale for crude by rail to PADD 1, and the refinery found itself facing the same structural issues that led to its near-shutdown in 2012. The company's favored narrative surrounding the bankruptcy filing has been to cast itself as the victim of runaway renewable identification number (RIN) costs, which are part of the EPA's Renewable Fuel Standards. However, RIN costs are only one of the poorly positioned refinery's troubles. A low conversion configuration and a reliance on expensive waterborne crudes put the refinery at a lasting competitive disadvantage, within both the region and the broader Atlantic Basin market.

Salvation Delivered by Rail

On the verge of bankruptcy in mid-2012, Carlyle injected capital into the facility (then fully owned by Sunoco) in exchange for a two-thirds share of the newly created PES joint venture. In addition to tax breaks and grants from the state of Pennsylvania, PES took on $550 million in debt, maturing in 2018, to finance capital investments in the refinery. These investments included an upgrade to light crude processing capacity and $186 million for the construction of a rail offloading terminal to bring in Bakken crude by rail. When this terminal opened in October 2013, the price differential between Clearbrook Bakken and landed Brent averaged more than $20/bbl, more than enough to offset the cost of rail transportation. By the time PES expanded its rail offloading capacity to 285,000 b/d in October 2014, the Bakken differential had narrowed to about $10/bbl. In fact, PES was a relative latecomer to the PADD 1 rail building boom; the nearby PBF Energy Delaware City refinery opened its offloading terminal in mid-2012 and expanded it twice in 2013.

IHS Markit Hurricane Update

19 September 2017

Hurricane Harvey Update

Capacity recovery across the Energy-Chemicals supply chain is advancing with most of the capacity back on line and operating rates continuing to ramp up. While crude and refined product price responses are returning to before hurricane values, downstream chemical products are seeing a variety of behaviors. For chemicals that were in tight supply, the price effects are pronounced and are expected to remain elevated through 4Q2017 and perhaps into 2018.

Our IHS Markit team of energy, chemical, transportation and economic experts will provide a webinar on the integrated view of the supply chain and recovery dynamics with guidance for future disruptions on 27 September 2017.

Executive Summary

		Product Expert Contributors
Refining	As of September 19, IHS Markit estimates that 15 of the 20 affected refineries are at or near normal operating rates. IHS Markit estimates that around 1.0 million b/d of distillation capacity (5% of US total) is still offline. However, steady progress appears to have been made and the four refineries in active restart may very well be operating normally by this weekend. The timeline for the fifth affected refinery is still uncertain. Even so, refined product markets have calmed considerably. As of yesterday, the NYMEX RBOB spot price was essentially back to its pre-Harvey level.	Rob Smith
U.S. Fuels Markets	Retail gasoline prices continue to cool off, dropping roughly a nickel over the past week to $2.615/gal. Though Florida has been one state where price erosion has been slow, though peak prices are squarely in the rearview mirror. Gasoline supplies are slowly returning to normal, but there are still some pockets of supply tightness in the Southeast as marketers are on strict supply allocations at most terminals. Tomorrow's EIA data should show another large draw from gasoline supplies lead by the Gulf Coast and East Coast (PADD 3 & 1) and in turn crude oil build as refineries return from downtime and imports continue to unload. Gasoline demand behaved as expected. Gasoline in the Southwest region (which includes Texas) dropped sharply for the week ending September 9th when compared to the week prior. In the Southeast (including Florida, Georgia and South Carolina) gasoline demand spiked when compared to the week prior, according to a survey of retail stations from IHS Market subsidiary OPIS. As refiners focused on getting more regular gasoline to market, diesel and premium gasoline have become tight in the Southeast.	Tom Kloza
Crude	EIA data indicate US oil production recovered sharply after the temporary disruptions of Hurricane Harvey. However, with Texas refineries still not back to full rates, crude oil inventories in the US Gulf Coast and Cushing have risen notably. The price differential between US and international crude remains relatively wide, with the Brent-WTI spread still above $5 per barrel. We expect the spread to narrow as refinery runs continue to recover, crude export volumes increase and crude imports subside.	Aaron Brady

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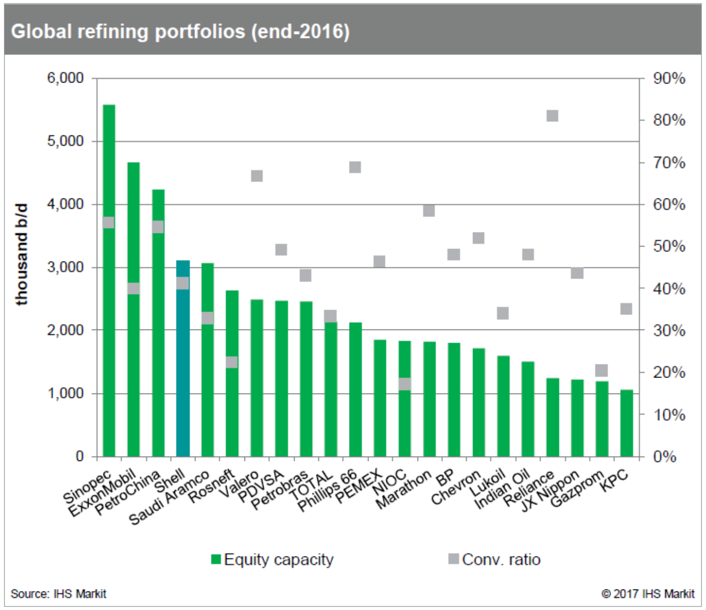
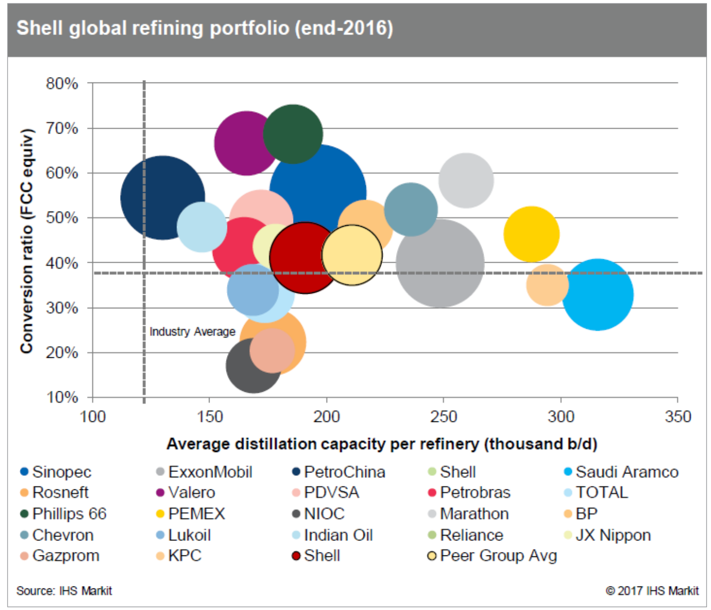
KEY ELEMENTS

Shell falls slightly behind the Global Major average in terms of per facility scale configuration





Refining Industry Drivers

Chemical Industry Drivers

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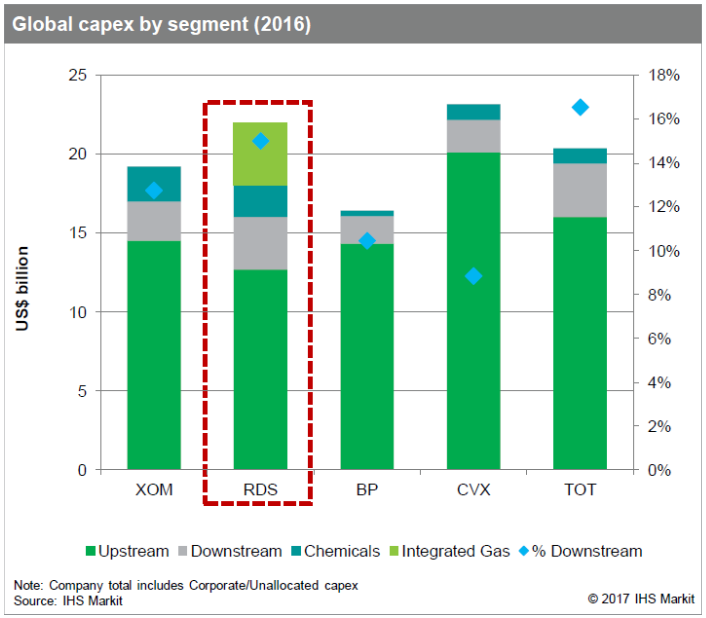
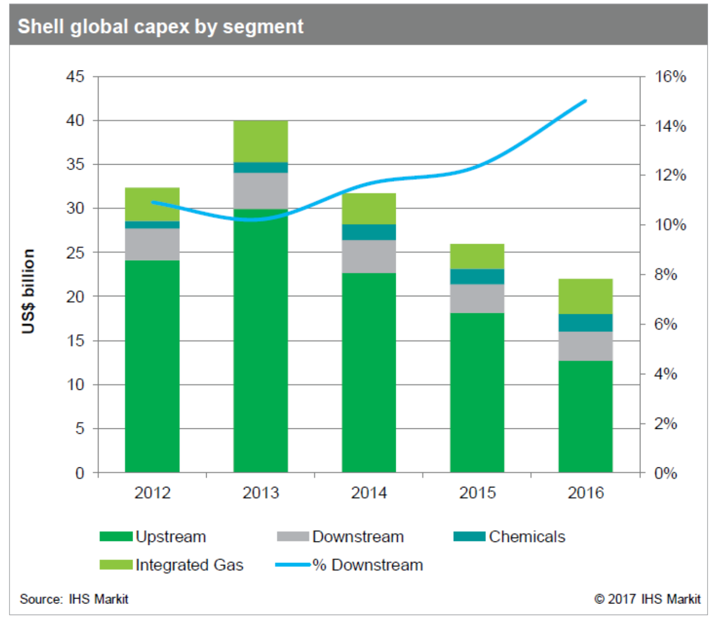
Shell's downstream capex ranked second among the Global Majors in 2016 behind only





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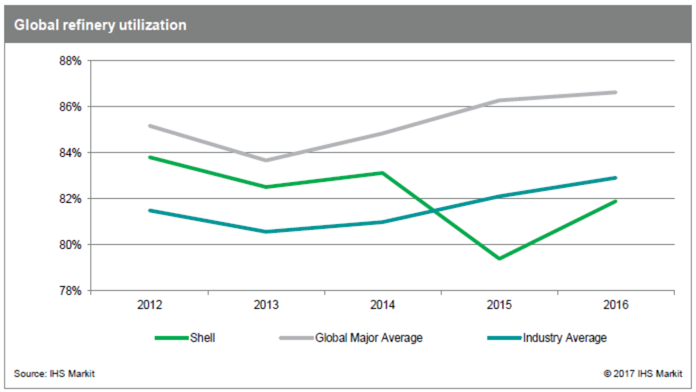
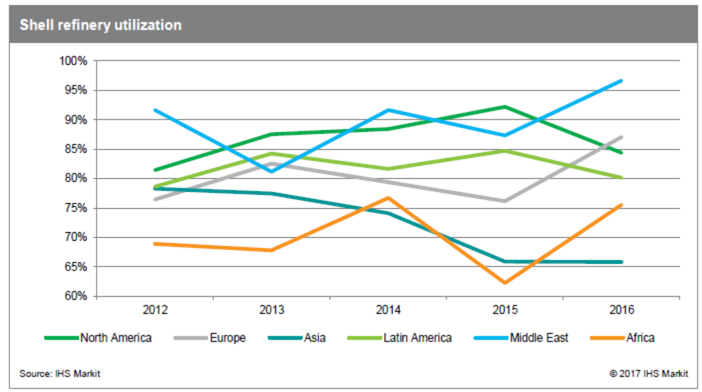
Portfolio Analysis – Utilization Rate Higher utilization at three of the company's six regions

- In 2016, Shell averaged a utilization rate of 82%, roughly an increase of three percentage points from the year prior.
  - However, the company's utilization continued to be behind that of its Global Major peers by almost five percentage points, and also fell below the global industry average of 82.9%.
- The company experienced a decrease in y-o-y utilization at two of its refining regions.
  - Lower utilization globally was largely a result of lower utilization at the company's Latin American and North American facilities.
    - The Latin American Dock Sud facility posted its lowest average utilization over the past six years (80.1%).
    - Its North American utilization rate decreased by eight percentage points y-o-y to around 85% in 2016, owing to planned and unplanned maintenance activities at the Martinez refinery, jointly owned Deer Park, Motiva refineries in the United States, and a major turnaround at the Canadian Scotford refinery.
- Lower utilization was partially offset by its European and Middle Eastern refineries which had a utilization rate of 87% and 97% respectively – highest since 2011; and a 14% y-o-y increase in utilization at the African plant.





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KEY ELEMENTS

Deliverables - CSP Refining

Refining and Marketing Company Reports
32 individual company reports analyzing each refining and marketing company's portfolio and competitive position.

Refining and Retail Extract
Refining and retail portfolio in Excel data files detailed for each company.

Refining Transaction Data Extract
Database capturing each acquisition and divestiture of refining, terminal and retail assets.

Performance Review Reports
Performance assessment of each Peer group based on operational and financial metrics. Includes events & developments, market updates and company benchmarking.

Quarterly Financial Benchmarking Extracts
Excel extracts containing reported financial results combined with asset modeling broken down by region and by segment for each company.

Company Perspectives
Reports and alerts discussing and analyzing key events and trends in the refining competitive landscape.

Deliverables - CSP Chemical

Chemical Company Reports
32 individual company reports analyzing each chemical company's portfolio and competitive position.

Key Performance Indicator (KPI) Dashboard
Interactive tool which benchmarks each chemical company's strategic position with peers/competitors.

Annual Performance Report
Annual summary report, benchmarking the top 15 producers for 47 chemical products based on capacity size, market position, and manufacturing position for the year within their peer group.

Quarterly Performance Review Report
Performance assessment of each Peer group based on analysis on revenue, EBITDA, ROCE among other financial matrices for chemical companies.

Company Perspectives
Reports and alerts discussing and analyzing key events and trends in the chemical competitive landscape.

Access the Experts

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