

**BAKER & O'BRIEN**  
I N C O R P O R A T E D

**U.S. Q2 2015 REFINING MARGINS RISE SLIGHTLY**

**Special Topic: European Refining Margins – A Dead Cat Bounce?**

Houston, September 3, 2015

Baker & O'Brien, Inc.'s 15Q2 release to *PRISM*<sup>1</sup> subscribers reflects a modest overall improvement in margins that masks sizeable increases in some regions and declines in others. The overall U.S. increase in margin was driven mainly by stronger gasoline demand and lower energy costs, offset by narrower crude oil differentials during the quarter. Motorists appeared to respond to lower gasoline prices by driving more, as vehicle-miles traveled increasing by over 3% for the quarter compared to a year ago.

**PRISM Cash Margins vs. Previous Periods (\$/Bbl.)**

	<b>15Q2 vs. 15Q1</b>	<b>15Q2 vs. 14Q2</b>
<b>PADD 1</b>	-1.98	-3.53
<b>PADD 2</b>	-1.32	-6.02
<b>PADD 3</b>	1.79	1.65
<b>PADD 4</b>	4.07	-1.53
<b>PADD 5</b>	2.73	6.54
<b>U.S. Overall</b>	<b>1.05</b>	<b>0.31</b>

As the adjacent table summarizes, PADDs 3, 4, and 5 showed refining margin gains in successive quarters, with PADD 4 leading the way. PADD 5 showed a substantially higher margin than the same period in 2014 largely due to the Torrance, California refinery outage, which occurred during 15Q1 and continues to impact product supplies in California. However, PADDs 1 and 2 showed a decrease in cash margin compared to the prior quarter and year-ago quarter. For PADD 1, some of this decline may be attributable to processing previously-committed volumes of railed crude oil from the Mid-Continent or Canada, even though the landed price was less competitive than waterborne imports. While many Northeast refiners have the flexibility to source a portion of their crude slate from those sources that result in the best margins, some crude slate volumes are bound by take-or-pay agreements, which can negatively impact earnings in a time of narrow WTI-Brent differentials.

**Key Refining Margin Metrics, \$/Bbl.**

	<b>2015</b>	<b>2015</b>	<b>2015</b>	<b>2014</b>	<b>2013</b>
	<b>July</b>	<b>Q2</b>	<b>Q1</b>	<b>Annual</b>	<b>Annual</b>
WTI	50.89	<b>57.86</b>	48.48	93.10	97.93
LLS	54.69	<b>62.97</b>	52.75	96.74	107.31
Brent	56.54	<b>61.95</b>	53.83	98.91	108.62
LLS – Maya	5.53	<b>7.67</b>	8.73	11.01	9.94
USGC LLS 321*	23.34	<b>17.66</b>	13.35	12.12	10.63
USGC LLS 6321**	16.81	<b>12.32</b>	9.99	8.05	6.92
Chicago WTI 321***	26.29	<b>23.70</b>	17.67	19.05	22.83

\* LLS deemed conversion to 67% conventional 87R gasoline and 33% ULSD

\*\* LLS deemed conversion to 50% conventional 87R gasoline, 33% ULSD and 17% Fuel Oil

\*\*\* WTI deemed conversion to 33% conventional 87R gasoline, 33% RBOB and 33% ULSD

As shown in the table at left, the U.S. Gulf Coast (USGC) LLS 321 crack spread increased by over \$4/Bbl. quarter-to-quarter, and the Chicago WTI 321 crack spread increased by more than \$6/Bbl. Compared to Q1 2015, WTI's discount to Brent decreased by \$1.26/Bbl. USGC refiners saw LLS become more expensive

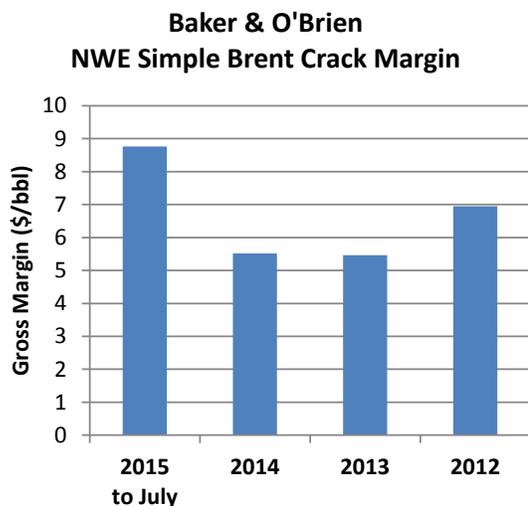
<sup>1</sup> *PRISM*<sup>TM</sup> is Baker & O'Brien's refinery modeling and database system that includes operational and economic performance details for refineries in the U.S., Canada, Europe, and Asia.

than Brent by about \$1/Bbl., causing some light crude imports to enter the market again. Refiners continue to maximize utilization to take advantage of the currently strong refining margins, however maintenance activities should pick up in the fall and winter.

### Special Topic: European Refining Margins – A Dead Cat Bounce?

“Even a dead cat will bounce if it falls from a great height,” goes the old Wall Street adage. Does this apply to the recent uptick in European refining margins? The 2008/2009 financial crisis abruptly terminated the “Golden Age” of refining. Ever since, European refining has been in the doldrums. Over the past five years, more than 1.8 million B/CD of European capacity has been shuttered. The closure of the Milford Haven, U.K. refinery in late 2014, was seen by many as just another step along the path of capacity rationalization to cope with new refineries coming on-stream in the Middle East and Asia, as well as increased competition from highly cost-advantaged U.S. refineries.

However, European refining margins have exhibited some surprising resilience and reversed what many believed to be the inevitable and continuing downward spiral in margins. The chart at the right shows that during the first half of 2015, the NWE gross margin—calculated on the basis of a cracking/viabreaking refinery processing Brent crude oil—increased from about \$5.50/B to almost \$9.00/B, or about 60%. The margins are on track for the year to be higher than any point in the last ten years. This has occurred against a backdrop of new competition from Middle East and Asian mega-refineries, as well as the revival of U.S. East Coast refiners processing lower-cost domestic crude and burning low-value natural gas.



Although many European refiners have invested to increase distillate yields, overall refinery output remains imbalanced relative to the market, with net naphtha/gasoline exports and distillate imports. However, in the first half of 2015, European refineries clearly benefitted from resurgence in U.S. gasoline demand, improved crack spreads, and relatively buoyant Asian demand growth. The table below shows how NWE crack spreads have improved in 2015. The current decline in global crude oil prices has been a welcome respite for some European refiners, since it has tended to narrow the competitive disadvantage the region faces when competing with export refineries in the Middle East, Russia, and the U.S., that have access to lower cost crude oil and natural gas supplies.

So the question is, can this improvement in margins be sustained, or is this the classic “dead cat bounce?” The following concerns remain: (1) European economic growth is tepid, with refined product demand flat or in decline, resulting in low overall refinery

Key NWE Refining Margin Metrics (\$/B)

	2015 to July	2014	2013	2012
Dated Brent	57.8	99.0	108.7	111.6
10 ppm Gasoline Crack	16.4	9.7	8.7	8.9
10 ppm Diesel Crack	14.9	13.9	16.1	18.4
3.5 wt.% Fuel Oil Crack	-13.4	-18.3	-17.4	-14.6

utilization; (2) European refinery complexity lags that of both the U.S. and the Middle East, with Asia rapidly adding modern, highly competitive, world-scale facilities; (3) there have been delays in completion of a number of large Middle East refineries which, when they eventually come on-stream, will increase global competition; and (4) new European Union and other individual government regulations continue to add additional cost burdens to refineries. These factors might lead one to conclude that further capacity rationalization may be in store for the European refining sector before a sustained and healthy margin environment can be achieved and allow the industry to successfully face global competition.

#### About Baker & O'Brien

Baker & O'Brien is an independent professional consulting firm specializing in technology, economics, and management practice for the international oil, gas, chemical, and related industries. With offices in Dallas, Houston, and London, the firm focuses primarily on the downstream industry and assists clients with strategic studies, mergers and acquisitions, and technology evaluations. The firm also provides expert services to support insurance claims, investigate operating incidents, and support a wide range of commercial disputes in the energy industry.

#### About PRISM

Baker & O'Brien's *PRISM* software is used to perform detailed analysis of individual refineries and the refining value chain from crude oil load port to products truck rack. The system combines a large historical database with a robust refinery simulator to provide analytical support to competitive assessments, strategic planning, crude oil valuation, and delivered cost of supply. The *PRISM* database currently includes operational and economic performance details for all refineries in the U.S. and Canada, most refineries in Europe, and over 50 refineries in the Asia Pacific region. The *PRISM* system is available for license and is used in consulting assignments for Baker & O'Brien clients.

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