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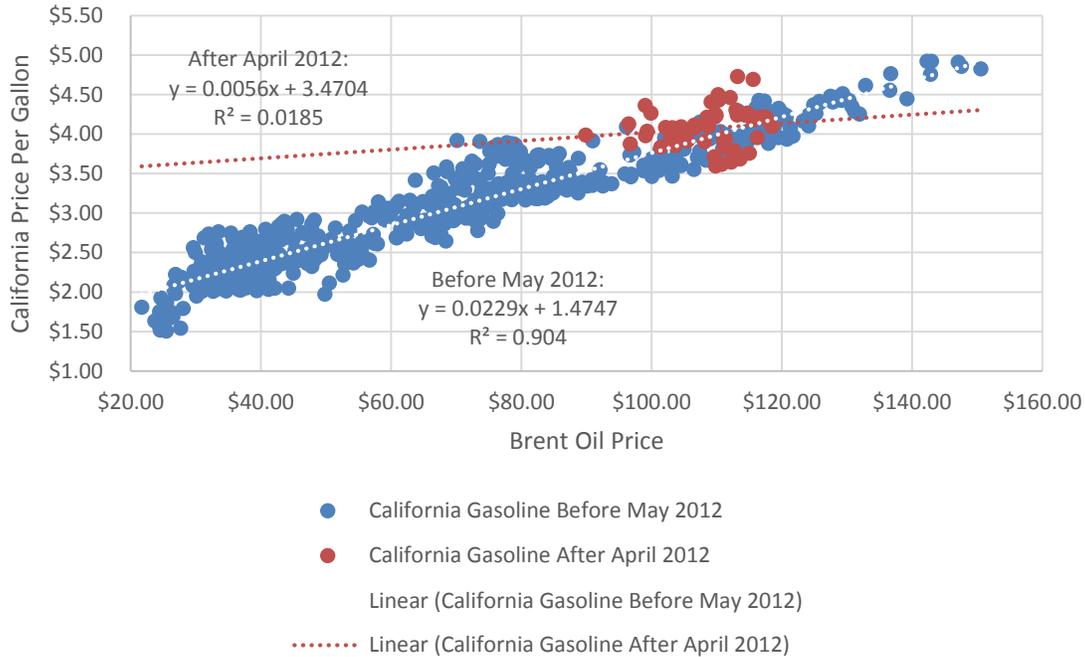
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Date: July 2, 2013  
To: McCullough Research Clients  
From: Robert McCullough  
Subject: The Year of Living Dangerously: Retail Gasoline Prices and Fundamentals

This report reviews the recent shift in the gasoline market in California. A careful review of the limited information available indicates that a relatively minor plant problem at ExxonMobil's Torrance refinery was to blame for the almost instantaneous increase in wholesale prices in October 2012. Yet there is evidence that the Torrance refinery problems were overstated and that speculation in gasoline began before the difficulties at Torrance were known and understood in the market. An article indicating that all of the majors took part in the speculative trading raises the question of collusion, since it would be unlikely that ExxonMobil, the owner of Torrance, would inform its competitors of operating problems prior to informing regulators and the media.

Since May 2012, retail prices on the West Coast have diverged significantly from fundamentals. As a simple measure, the correlation of California retail prices and world oil prices was 90%, but in May the correlation had fallen to less than 2%. A traditional statistical study would be unable to reject the hypothesis that California retail prices are independent of world oil prices.

**Brent Crude and California Gasoline Prices: 2000 - Present**



The chart above draws a line (shown in red) through gasoline prices since April 2012. The shallow slope of the line indicates the marginal impact world oil prices have had upon California consumers since April 2012. Market data until May 2012 is shown in white. The slope of the white line reflects the traditional relationship between oil prices and gasoline prices. The quality of the statistical relationship is shown by the  $R^2$ . A perfect relationship between two variables has an  $R^2$  of 1.00. The  $R^2$  of two completely unrelated variables is 0.00. The  $R^2$  value of 0.904 indicates that before May 2012, the price of gasoline could be well explained by the price of crude oil. However, since May, the  $R^2$  value of .0185 suggests that there is almost no relationship between oil prices and gasoline prices in California.

The industry's response to studies questioning this abrupt change is generally unconvincing. The May spike was widely blamed on the Cherry Point fire in February. The October spike was largely blamed on the outage at Torrance, but the Richmond explosion – two months earlier – was also blamed. No explanation has been forthcoming on why price spikes would be delayed by several months instead of occurring immediately.

The Year of Living Dangerously: Retail Gasoline Prices and Fundamentals

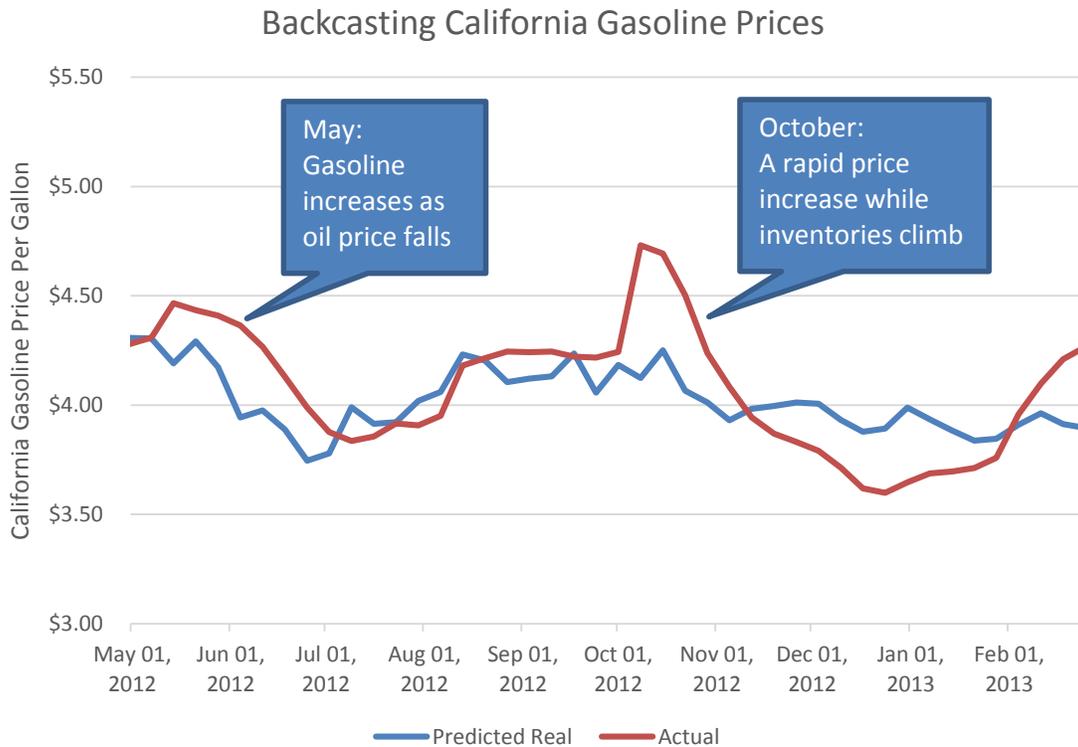
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Gasoline markets in the U.S. traditionally track world oil prices. Additional critical information concerns the level of production and the size of gasoline inventories. These well-known factors are available on a weekly basis from the Energy Information Administration.<sup>1</sup> Some states provide more detailed information. The California Energy Commission publishes the Weekly Fuels Watch Report, which offers detailed data on gasoline inventories and production.<sup>2</sup>

It is often useful to “backcast” economic events, in this case examining a forecasting model to see how well the explanatory variables – oil prices, production, inventory, and demand – explain gasoline prices. The backcast of gasoline prices in California identifies two periods, May and October 2012, as periods when prices diverged significantly from fundamentals.

The following chart compares the prices that would have resulted from the forecast with the actual prices over this period.



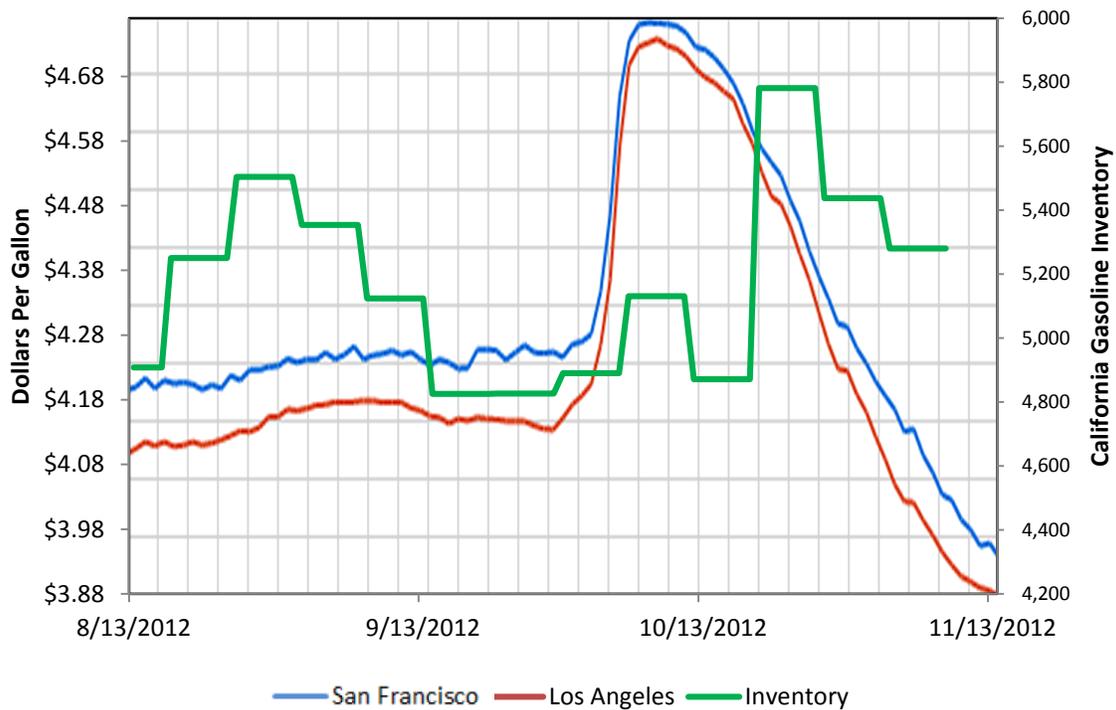
<sup>1</sup> <http://www.eia.gov/petroleum/supply/weekly/>

<sup>2</sup> [http://energyalmanac.ca.gov/petroleum/fuels\\_watch/index.php](http://energyalmanac.ca.gov/petroleum/fuels_watch/index.php)

The May 2012 price spike reflects a period when gas prices increased while oil prices declined. The October spike is interesting since the price increase was more dramatic and took place over a very short time period. In fact, the rate of price increase over the October 2012 period is the highest observed between 2000 and the present, even after correcting for inflation.

As shown in the chart above, the fundamentals in October 2012 would not have indicated a retail price increase. October gasoline sales in California showed a small increase over September 2012 and the price of crude in October showed a small decline over the period of the price spike. In fact, inventory levels actually increased during the spike – contradicting the shortage theory.

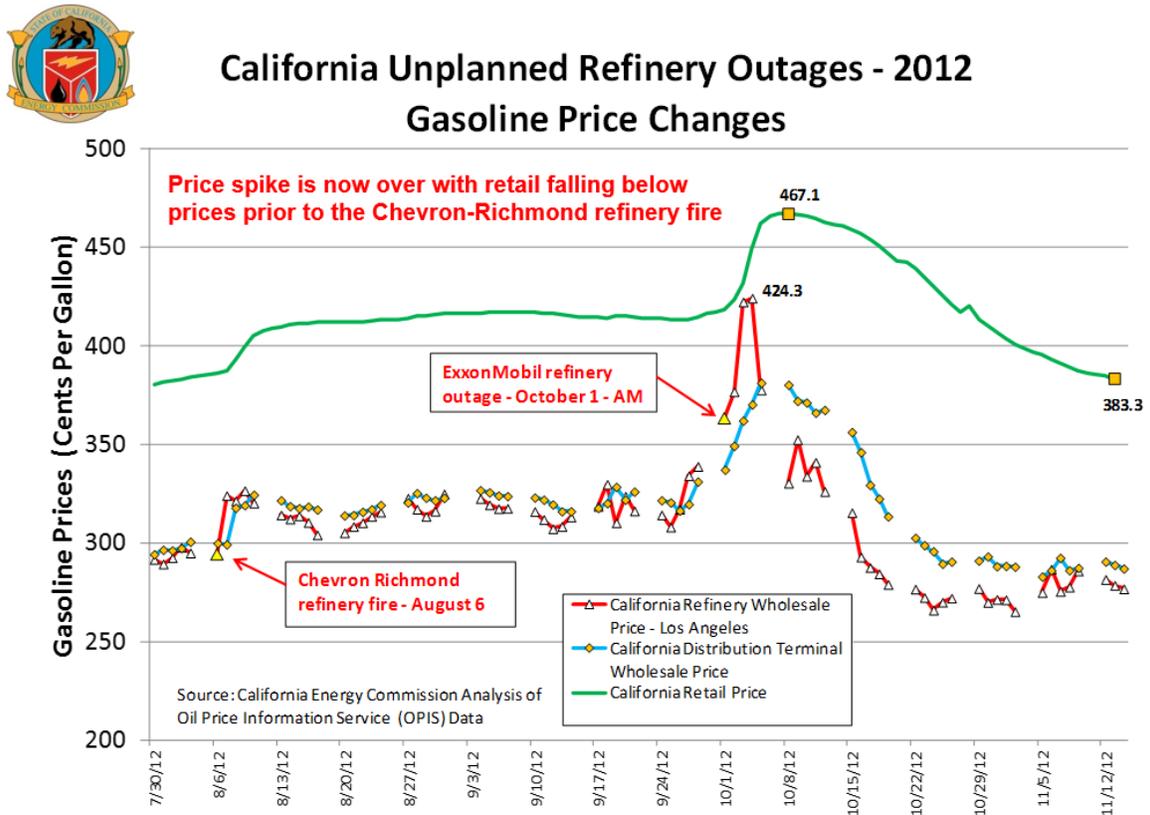
**California Gasoline Prices and Gasoline Inventories  
 August Through November**



The California Energy Commission’s alternative explanation of problems at ExxonMobil’s Torrance refinery appears to have some merit, although the timing of the price

spike is highly suspect.<sup>3</sup> As mentioned, it appears that the price began spiking before the “power failure” at the Torrance refinery was publicly announced.

Gordon Schrepf, the California Energy Commission’s witness at the November 15, 2012 hearing held by the California Senate, provided the following chart:



This chart suggests that the steep retail and wholesale price increases incurred immediately after the ExxonMobil problems at Torrance. Mr. Schrepf argued that later data releases from the California Energy Commission showed stable production and increasing inventories which mitigated the perception of shortage and gradually reduced prices.<sup>4</sup>

<sup>3</sup> Schrepf, Gordon. “California Refineries: System Reliability, Gas Prices and the Economy.” November 15, 2012.

<sup>4</sup> The October 5, 2012 CEC Weekly Fuels Watch Report indicated that inventories had actually increased from the previous week. [http://energyalmanac.ca.gov/petroleum/fuels\\_watch/output.php](http://energyalmanac.ca.gov/petroleum/fuels_watch/output.php)

Announcement effects such as the California Energy Commission's alternative explanation generally are difficult to prove. The valuable information provided in the CEC's weekly reports is likely to affect market perceptions. Unfortunately, the data also reflects the fundamentals in the market, meaning that it is statistically very difficult to determine whether it was the CEC's report or the market fundamentals that affected prices.

The timing of the announcement of a power failure at ExxonMobil's Torrance refinery is another matter. The initial event, a frequency fluctuation on SCE's system, was extensively reported in the media. One reporter even referenced the "power bump, which was felt in the Daily Breeze offices on Hawthorne Boulevard, knocking out electricity for a split-second."<sup>5</sup>

ExxonMobil filed notifications with the South Coast Air Quality Management District (SCAQMD) at 8:20 a.m. and the California Emergency Management Agency at 8:28 a.m. Such notifications are not very informative other than noting the date and time of the event. Reuters reported on the SCAQMD flare notification at 8:21 a.m.<sup>6</sup> The first in-depth article describing the power outage was released by Dow Jones Newswire at 8:55 a.m.:

ExxonMobil Corp. (XOM) on Monday said flaring could be visible throughout the day at its oil refinery in Torrance, Calif., due to equipment breakdown.

The company reported the incident to the South Coast Air Quality Management District soon after it occurred at 10:20 a.m. EDT on Monday. The report said the unplanned flaring event is expected to end by midnight, but didn't say what equipment was involved in the event.<sup>7</sup>

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<sup>5</sup> Altman, Larry. "Torrance ExxonMobil refinery flare erupts against morning sky." *Daily Breeze*, October 1, 2012.

<sup>6</sup> "Unspecified Breakdown Leads to Flaring at ExxonMobil's 149,500 b/d Torrance, California Refinery." Reuters, 11:21 a.m. EDT., October 1, 2012.

"ExxonMobil Corp. reported unplanned flaring due to an unspecified breakdown at its Torrance refinery Monday morning, according to a filing with the South Coast Air Quality Management District,"

<sup>7</sup> Marton-Vitale, Rose. "ExxonMobil Reports Equipment Breakdown, Flaring at California Refinery." *Dow Jones Newswire*, October 1, 2012.

This story was unlikely to lead to panic buying in California markets, although an article published 45 minutes later gave significantly more information:

REFINERY NEWS: L.A. CARBOB DIFFERENTIAL JUMPS OVER  
35 CENTS ON TORRANCE UPSET

Houston (Platts)--1Oct2012/1240 pm EDT/1640 GMT Refinery: Torrance, California Owner: ExxonMobil Overall capacity (b/d): 149,500 Units affected: N/A Units capacity (b/d): N/A Duration: Emissions window 7:20 a.m. PDT to 11:59 p.m. PDT Monday Notes: The Los Angeles CARBOB differential spiked more than 35 cents Monday after a power failure at the refinery, sources said.

The main California-specific grade of gasoline was heard done at NYMEX November RBOB contract plus 58 cents and plus 65 cents/gal early, and then bid to plus 85 cents/gal, with offers at \$1/gal heard. Platts assessed the differential at plus 50 cents/gal on Friday.

The differential increase came after reports of the breakdown at the gasoline-centric plant that sources said suffered a power failure. An ExxonMobil spokeswoman did not immediately respond for comment.

The underlying November RBOB futures contract was trading at \$2.8912/gal at noon EDT. Source: Market sources<sup>8</sup>

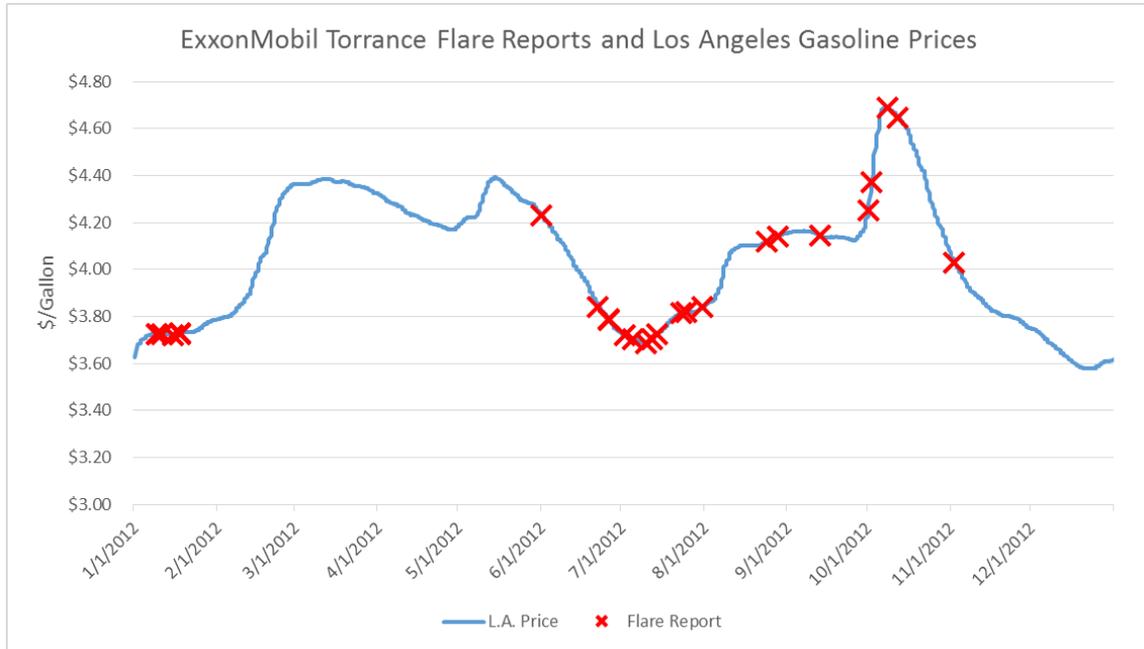
Translated into everyday English, this article says that prices in wholesale California markets had spiked \$.35/gallon within 45 minutes of the first substantive coverage by the media and 80 minutes after ExxonMobil reported the event to SCAQMD.

It is clear that the reporting of the flaring to SCAQMD by Exxon did not cause, or even set in motion events that would cause prices to increase by \$.35/gallon. During 2012, the Torrance facility reported 27 other flaring events, none of which set off price increases anywhere near the scale of those seen on October 1<sup>st</sup>.<sup>9</sup>

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<sup>8</sup> "Refinery News: L.A. CARBOB Differential Jumps Over 35 Cents on Torrance Upset." *Platts Commodity News*, October 1, 2012.

<sup>9</sup> SCAQMD flare archives at [http://www.aqmd.gov/listserver/email/exxon\\_mobil\\_torrance.arc/right.htm](http://www.aqmd.gov/listserver/email/exxon_mobil_torrance.arc/right.htm)



Why was this flaring report different, and what happened during this period that raised the wholesale price so significantly? From the official notifications and the thin media coverage, no outsider would be able to conclude that a major event had occurred at Torrance. As we discuss below, press coverage and SCAQMD emissions records suggest that production continued during this time period.

One media article described the majors jumping into the market on October 1:

“Today, gasoline was like a bat out of hell,” said the trader who asked not to be identified. “All the majors came out and bought. This morning it was all bad news from the get-go.”<sup>10</sup>

The morning in question was roughly contemporaneous with the reports above since the article’s author and, presumably, the unidentified trader, were in Houston.

The wholesale prices increased in California over three days. On Monday October 1<sup>st</sup>, there was a significant price increase of over \$.20/gallon.<sup>11</sup> On Tuesday, prices increased \$.14/gallon and on Wednesday, October 3<sup>rd</sup>, prices increased \$.45/gallon.

<sup>10</sup> “US West Coast Products - Gasoline jumps on refinery outage.” *Reuters News*, October 1, 2012.

<sup>11</sup> Different reports give different values for the price increases. The OPIS data represents an end-of-day survey. Press reports often cite anecdotal evidence after discussions with individual traders.

The scale of the problem at Torrance is still doubtful. On Monday, ExxonMobil told the media that there had been an external power outage:

“The ExxonMobil Torrance Refinery experienced an unplanned flaring event due to an external power interruption and notified the Torrance Fire Department,” spokeswoman Gesuina Paras said in an email. “The cause is under investigation.”<sup>12</sup>

A spokesperson for Southern California Edison described the situation differently:

“But SCE says the only electricity incident that morning was a ‘flickering light-type condition,’ according to Steve Conroy, a Southern California Edison spokesman.

Conroy describes it like a hiccup – lasting less than a second according to residential customers in the area. He says there was no outage at the substation.

‘An outage just means you’ve lost service. Your power goes off. We’re not aware of that happening in the community to other customers,’ said Conroy. ‘How that condition affected the refinery is not known to us at this point in time.’<sup>13</sup>

Our previous reports on the gasoline price spikes relied on emissions data for individual refineries supplied by California’s Air Quality Management districts.<sup>14</sup> We returned to this source to better understand how the Torrance refinery was affected by this flaring event and the resulting impact on the October 2012 price spike.

The evidence from the nitrogen oxide (NOx) reports filed by ExxonMobil at SCAQMD tends to support a more moderate view of the incident. NOx emissions from the refinery’s cogeneration facility dropped to 30% of Sunday’s levels. This would indicate that the co-generation unit had gone off-line at 7:30 a.m. on October 1.

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<sup>12</sup> “Refinery News Update: ExxonMobil reports breakdown at Torrance, California.” *Platts Commodity News*, October 1, 2012.

<sup>13</sup> “ExxonMobil Torrance refinery investigated for effect on spiking California gas prices.” *Los Angeles News*, October 12, 2012.

<sup>14</sup> “May and October 2012 Gasoline Price Spikes on the West Coast.” November 15, 2012, <http://www.mre-search.com/pdfs/489.pdf>

Cogeneration equipment is used to produce steam for operations elsewhere at a refinery. Torrance has three small cogeneration turbines that are integrated with the facility. A temporary “flicker” would normally take power generation equipment off-line in order to protect it from operating at a different frequency than the grid. The NO<sub>x</sub> data supports this scenario. The Fluid Catalytic Cracker, a critical part of the production process, showed increased NO<sub>x</sub> emissions through Wednesday, October 3, which is consistent with the flaring associated with a shutdown and startup procedure.

Overall, the NO<sub>x</sub> data does not support a full plant closure as a result of the frequency problem at Southern California Edison. Other than the Fluid Catalytic Cracker, half of the NO<sub>x</sub> reports from Torrance stayed at normal operating ranges during this period. In fact, most of the metered units continued at an intermediate level of operations.

By Wednesday, October 3, a Dow Jones Newswire article corroborated the NO<sub>x</sub> data:

Update: ExxonMobil Says Operations Normalizing at Its 149,500 b/d Torrance, California Refinery by October 3 after Power Outage October 1

ExxonMobil Corp. said operations at its Torrance refinery were getting back to normal following a plant-wide power outage Monday morning. The power interruption, which was caused by an outage at a Southern California Edison substation, resulted in refinery unit shutdowns and slowdowns, which caused flaring. ExxonMobil said flaring associated with the normalization process could continue through October 9, according to a filing with the Southern California Air Quality Management District. The refinery anticipated only minimal impact to production, and expected to meet all its contractual commitments.<sup>15</sup>

The frenzied trading on October 1, 2012 followed by additional wholesale price increases on October 2 and 3 seem anomalous. The trading activity on Monday apparently predated news about the scale of the problems of the Torrance refinery and the media significantly overstated the severity of the problem:

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<sup>15</sup> “ExxonMobil: Torrance, California, Refinery Operations Normalizing after Power Outage.” *Dow Jones Newswires*, October 3, 2012.

REFINERY NEWS: ExxonMobil reports breakdown at Torrance, California

Houston (Platts)--1Oct2012/1222 pm EDT/1622 GMT Refinery: Torrance, California Owner: ExxonMobil Overall capacity (b/d): 149,500 Units affected: N/A Units capacity (b/d): N/A Duration: Emissions window 7:20 a.m. PDT to 11:59 p.m. PDT Monday Notes: ExxonMobil's Torrance refinery suffered a breakdown Monday leading to potential emissions/flaring, according to an unplanned flare event filing to state regulators.

The company did not immediately respond to a request for comment, but sources said the 149,500 b/d gasoline-centric plant near Los Angeles suffered a power failure.

The filing did not specify the nature of the breakdown or which unit or units may be involved. The filing said related emissions exceeding allowed levels were, according to estimates, more than 500,000 cubic feet of combusted vent gas and more than 500 lbs of sulfur oxides.<sup>16</sup>

Logically, ExxonMobil might have immediately sought some additional supplies upon hearing of the shutdown of the cogeneration units. It would not have been logical for ExxonMobil to notify its competitors of its activities, nor for the competitors to immediately start buying in the market on receipt of a standard flare report at SCAQMD.

A reasonable alternative explanation is that speculation in the California wholesale gasoline market may have been the cause of the exaggerated media reports, and that the relatively minor outage at Torrance was viewed as an opportunity to secure windfall profits.

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<sup>16</sup> "Refinery News: ExxonMobil reports breakdown at Torrance, California," *Platts Commodity News*, October 1, 2012.