PIRINC

You may be interested.

PIRINC has prepared the enclosed report, *The Gasoline Market in California: An Update*, as a follow-up to one prepared in April, *Gasoline Price Developments: Once Again California Leads the Way.*

As noted in PIRINC's April report, the state is a relatively insulated product market, in large part because of the special, more costly reformulated gasoline required for most of the market. Few refiners outside the state produce it, leaving the market vulnerable to disruptions in local supply. This year, the state experienced a series of disruptions, which began early in the year and continued through the early summer, with lingering aftereffects for several months beyond.

Although California's required CARB gasoline is normally not produced outside of PADD 5, the initial local supply disruptions and upward price pressures encouraged an exceptionally large inflow of gasoline to the region. The additional supply offset much of the shortfall versus normal requirements and helped bring down prices from their peak levels in the early spring. As of early December, these market-induced new supplies to the region, plus improvements in local gasoline production, have reduced gasoline price differentials to below the levels prevailing in early February and about in line with differences in tax levels and costs of producing CARB gasoline.

The report also notes that the region's relative insulation in terms of product does not apply to crude.

If you have any questions or comments, please call John Lichtblau, Larry Goldstein or Ron Gold.

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The Gasoline Market in California: An Update

From mid-February through early December, national average gasoline prices have risen by about 35 cents/gallon. Virtually the entire increase can be traced to the rise in the cost of crude oil. In California, gasoline prices went up by about 30 cents/gallon over the same period, slightly less than the average for the country as a whole. But unlike the rest of the country, the state experienced price spikes along the way that at their extremes created as much as a 50 cent/gallon price difference between California and the country as a whole. These developments have triggered a number of investigations, including a recently released report by the California Attorney General's office.[1]

In April, when price differences between California and the rest of the country were at their most extreme, PIRINC published a report on gasoline price developments in California pointing out that for products, particularly gasoline, the State is a relatively insulated market, due in large part to the special reformulated gasoline required.[2] Few refiners, domestic or foreign, outside the state normally produce it, leaving the market vulnerable to disruptions at local refineries, which tend to run at high utilization rates to meet normal demand. These points were acknowledged in the California Attorney General's report. It should be noted that this insulation does not apply to crude oil, which moves freely into the region, and, therefore, at prices that move about in line with crudes elsewhere. Indeed the share of foreign crude is rising as local production declines. In 1996/97, foreign crude accounted for only 15% of West Coast supply. Currently its share is 25% and rising.

This report starts with an examination of price movements to date and then focuses on the supply developments over the course of the year that first produced the extreme differentials between California and the rest of the country and then helped moderate them. The report notes that at the beginning of 1999gasoline stocks outside of the PADD 5 were at their highest levels in recent years, and remained so until mid-year before drifting downward. In contrast, PADD 5 stocks began the year in the middle of their range in recent years, but in the face of refinery operating problems in January and February, were quickly drawn towards minimum levels where they have more-or-less remained. The low inventories made prices exceptionally sensitive to the additional disruptions to refinery operations that came in March, May, and July. Although California's required CARB gasoline is normally not produced outside of PADD 5, the price differentials that opened up versus the rest of the country encouraged an exceptionally large inflow of gasoline to the region. Refiners in other areas (including from as far away as South Korea, Singapore and Finland) increased runs, re-blended stocks, etc. to create CARB quality gasoline. Overall, the additional supply attracted by the price differentials offset much of the shortfall versus normal requirements and helped bring down prices from their peak levels in the early spring. As of early December, these market-induced new supplies to the region, plus improvements in local gasoline

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[1] **Preliminary Report to the Attorney General Regarding California Gasoline Prices**, November 22, 1999. At the request of Senator Feinstein, the General Accounting Office is in the process of preparing a report on this subject.

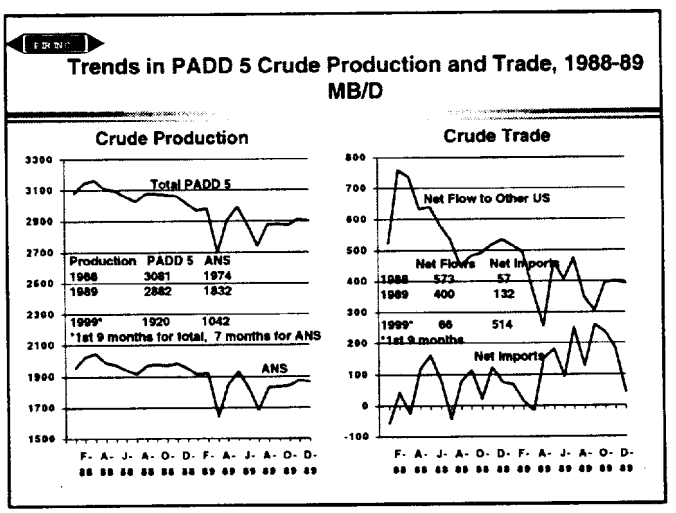
[2] **Gasoline Price Developments: Once Again California Leads the Way**, April 1999

production have reduced both wholesale and retail gasoline price differentials to below levels prevailing in early February[3].

A BRIEF NOTE ON WEST COAST CRUDE OIL

Before discussing gasoline developments, this section presents a brief discussion of the crude oil market in the region, which has behaved very differently than the gasoline market. Unlike gasoline, the regional crude market is open to trade and therefore, crude prices are not significantly impacted by changes in local supply conditions.

The region had a dramatic test of the crude oil market in March 1989 when as a result of the Exxon Valdez accident, supplies of Alaskan oil were interrupted---with production of North Slope oil completely shut in for 4 days. Overall, crude production in PADD 5 fell by about 280 thousand barrels/day, or about 10%, between February and March. The year also saw the beginning of the long-term decline in North Slope production that would have required some rebalancing of the regional crude market in any case. To illustrate the impact of these developments and the adjustments they induced, the chart below shows trends in regional crude production and crude trade between 1988 and 1989.

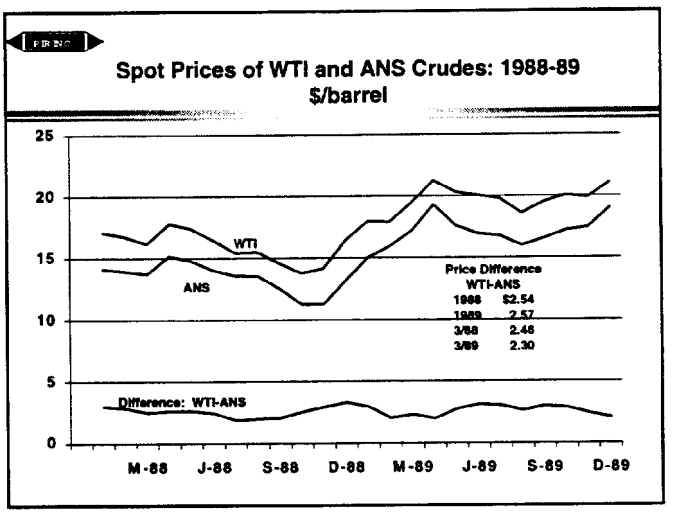


As shown in the left panel, average PADD 5 production fell by about 200 thousand barrels/day between 1988 and 1989, with Alaskan North Slope production accounting for most of it. In March 1989, however, ANS production was about 400 thousand barrels/day below year-earlier levels. The right panel shows the adjustments in crude trade that took place over the course of the year. Net flows from PADD 5 to other parts of the US fell by 173 thousand barrels/day (from 573 to 400) while net imports rose by 75 (from 57 to 132). Since then, the region has become far more reliant on imports. Production in the region is down from about 3.1 million barrels/day in 1988 to 1.9 this year with the decline concentrated in ANS crude. Net imports have risen to 500 thousand barrels/day while net flows to other PADD's have fallen to minimal levels.[4]

The adjustments in crude trade to the decline in local production between 1988 and 1989 took place without any significant change in local crude prices relative to prices elsewhere. As shown in the chart on the left, there were no significant changes in the spot prices for ANS crude versus WTI over the entire period. In March 1989, when ANS

[3] Initially higher prices helped maintain supply/demand equilibrium, thereby avoiding outright shortages.
[4] In the first nine months of this year, crude imports averaged 588 thousand barrels/day while exports averaged 74. Outflows to other PADD's averaged 66 thousand barrels/day.

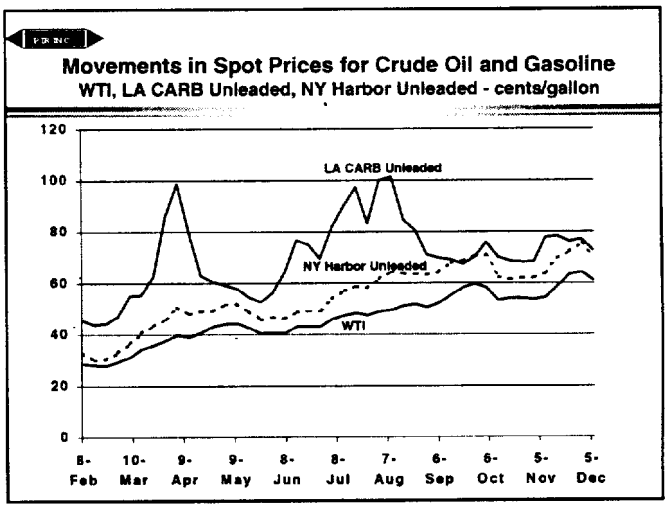
crude supplies were disrupted, the difference between ANS crude and WTI was $2.30, only marginally narrower than the year earlier differential of $2.46.



This year local crude prices, in contrast to gasoline prices, continued to move in line with prices elsewhere. For 1999 to date, the average spot price difference between WTI and ANS crude was $1.55/barrel or 3.7 cents/gallon. At its monthly peak in June the price of WTI exceeded ANS crude by $2.08/barrel or 5 cents/gallon, and at its minimum in October, $0.88/barrel or 2 cents/gallon.

Trends in Spot Gasoline Prices

The chart below summarizes trends through early December in spot prices for gasoline on the East and West Coasts, using prices for Los Angeles Harbor CARB unleaded and New York Harbor prices for unleaded. Also shown for comparison purposes are spot prices for WTI (West Texas Intermediate).

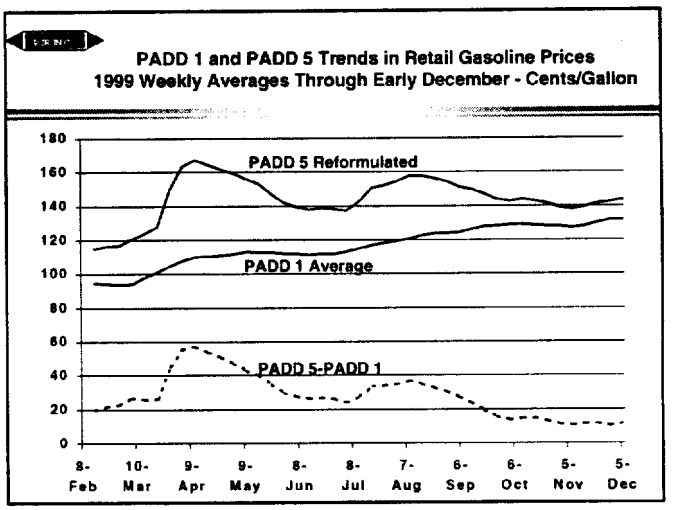


In early February, the spot crude price was about $12/barrel or about 28 cents/gallon. The New York Harbor Unleaded price was less than 5 cents/gallon above the crude price while the price for spot CARB unleaded was about 15 cents/gallon above the crude price. The New York spot price moved upward roughly in line with the crude price. By early December, both prices had reached more than double their early February levels. The differential between the spot New York Harbor gasoline price and the crude price widened to about 10 cents/gallon by July where it has since remained. Spot CARB gasoline followed a very different path to get to approximately the same endpoint. Refinery problems in February and March, coupled with low inventories provoked a sharp rise in spot gasoline prices that by early April reached nearly $1/gallon, about 60 cents/gallon above the crude price. Spot CARB prices fell back to within 12 cents of the crude price by early May before new rounds of refinery problems led to a new price surge. Since their peak in early August CARB prices have fallen back considerably, despite rising crude prices. As of early December, the Spot CARB price was only 2 cents above the New York price and only 12 cents above the price of crude.

Wholesale prices are most sensitive to supply tightness, especially when stocks are low. Retail prices also respond to these conditions but to a lesser extent, and with a lag.[5]

Trends in Retail Gasoline Prices

Trends in retail prices in PADD 5 and PADD 1 are summarized in the chart below. The chart shows average retail prices for reformulated gasoline in PADD 5 and average gasoline prices in PADD 1[6]. The dotted line at the bottom shows differences between the two. In mid February, the price differential between the two regions stood at 20 cents. The differential widened to a peak of nearly 60 cents in April, drifted down to about 25 cents in early July, and rose to a new, lesser peak of about 35 cents in August. Since then, the differential has narrowed substantially, reaching the 10-11 cent/gallon range by early November, where it has remained. Retail prices in PADD 5 in early December were down by about 25 cents/gallon from their peak in early April while prices in PADD 1 were up by about the same amount.



The unique behavior of West Coast gasoline prices reflected the special supply conditions associated with the unique quality requirements of that region relative to the rest of the country. These conditions are discussed in the next sections of the report.

Gasoline Stocks in PADD 5 and the Rest of the Country

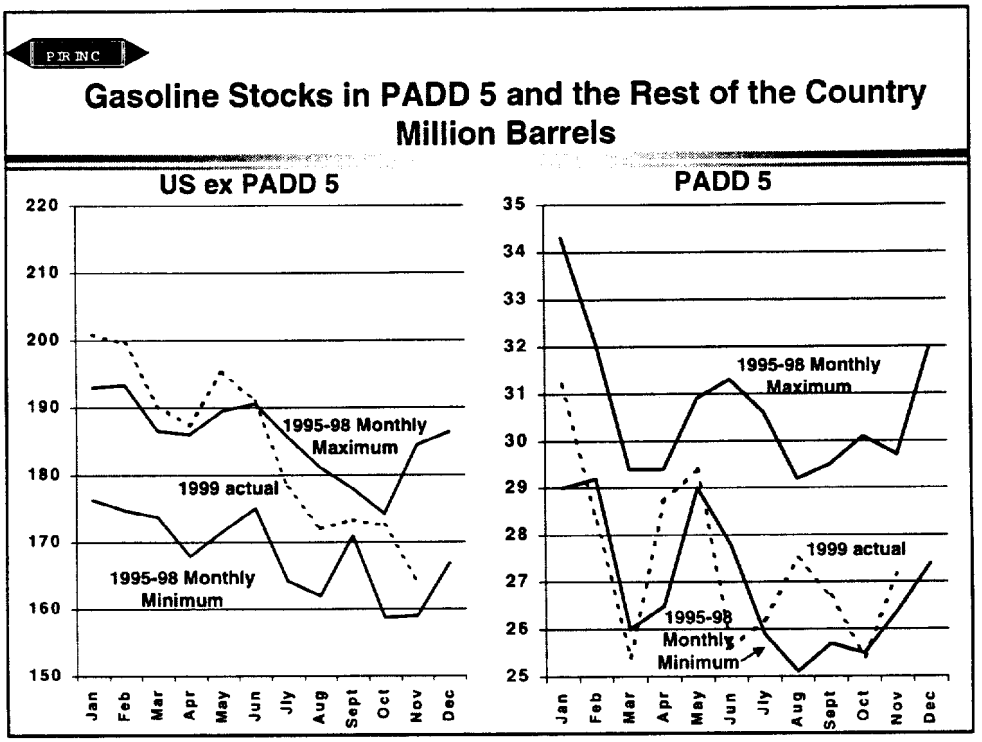
Apart from the West Coast, the rest of the US began 1999 with gasoline stocks at very high levels. On the West Coast, gasoline stocks were not particularly high to begin with and quickly fell to very low levels as refinery operational problems developed in California.

The two panels of the next chart focus on gasoline stocks in the US ex PADD 5 and within PADD 5. Both panels show the monthly minimum and maximum stock levels realized over the 4 years 1995-98 and actual stocks over the course of 1999 through end-November.

For the US ex PADD 5 gasoline stocks remained above their 1995-1998 maximum levels through midyear and have since drifted slowly down toward minimum levels. On the West Coast the year began with stocks about midway between minimum and maximum

[5] Between early March and early April, the spot price differential between the two spot prices rose by 34 cents/gallon while retail price differentials between PADD 5 and PADD 1 rose by 26 cents.

[6] Over the period, the PADD 5 average retail price for reformulated has been about 4.5 cents/gallon above the California price of unleaded regular as reported by the California Energy Commission.



levels but were quickly drawn below the 1995-1998 minimum levels with the onset of operational problems at the California refineries[7]. With gasoline inventories at such low levels, the supply-demand balance in the region was exceptionally vulnerable to the new refinery problems that surfaced in March and again in May and July[8]. Since then, West Coast gasoline inventories have tended to remain near minimum levels, indicating ongoing price sensitivity to changes in supply availability.

Trends in PADD 5 Supplies of Finished Gasoline

As many analyses have noted, California is a relatively insulated gasoline market as a result of distance from supply sources beyond the West Coast and because of its unique product specifications.[9] Refiners elsewhere have some capability to make CARB gasoline but costs of blending, storage, product segregation and shipping CARB gasoline to the West Coast are high and refiners face the risk that by time such supplies are produced and delivered to the California market, any initial price incentive to do so may have long since disappeared.[10] Despite these factors, this time production problems were

[7] These began in January with the crude unit shutdown at Chevron's El Segundo Refinery followed in February by closure of Tosco's Avon Refinery as a result of a fire. The Avon Refinery remained shut until July.

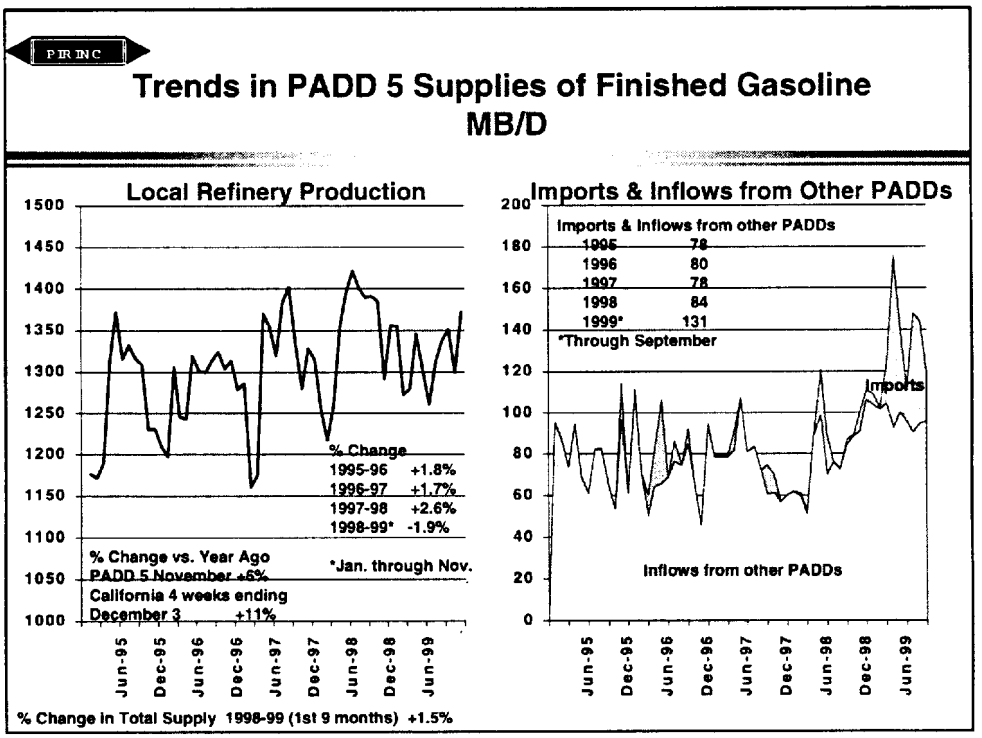
[8] While most production problems have been resolved some remain. Chevron's Richmond Refinery hydrocracking unit, a processing plant, which produces gasoline and jet fuel, caught fire in March. The refinery experienced a second fire in July. While partial production has been restored the company was not anticipating a return to full operations before the end of the year.

[9] For example, the average sulfur level in California gasoline is under 30 ppm, about one-tenth the level in the rest of the country. The EPA is proposing to require 30 ppm gasoline nationwide by 2004, but California is planning to move to still lower levels by that time.

[10] It is not possible to hedge directly against this risk in the absence of a futures market for CARB gasoline. Under the Jones Act, shipments from other US ports to the West Coast must be made in US flag tankers, adding 8 to 12 cents/gallon to the cost of doing so.

expected to persist and and as a result there was a substantial increase in supplies from outside the region. The increase appears to have offset much of the shortfall in normal supply levels.

The chart below shows, in the left panel, monthly trends beginning in 1995 in PADD 5 production of finished gasoline and, in the right panel, monthly trends in imports plus inflows from other PADDs of finished gasoline. As shown in the insert table in the left panel, on an annual basis, local production of finished gasoline grew by about 2% a year from 1995 through 1998, with 1998 growth reaching 2.6%. But for the first nine months of 1999, production was down 2.2% versus the same period in 1998. Given continuing economic growth in the area, a production increase of at least the average of recent years would have been needed to satisfy normal demand growth[11]. There has been a recent substantial improvement in gasoline production. November production of finished gasoline in PADD 5 was up 6% versus a year ago while production by California refineries for the 4 weeks ending December 3 was up 11%.



As indicated in the right panel, the total of imports and inflows from other PADD's averaged about 80 thousand barrels/day from 1995 through 1998 with imports generally playing a very minor role. This year has been different, with outside supplies up nearly 50 thousand barrels/day through September versus the year earlier. Imports rose from an average of 5.5 thousand barrels/day in the first nine months of 1998 to 33 this year while

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[11] The latest (December) Short-Term Energy Outlook released by the US Department of Energy estimates that for the country as a whole, gasoline demand in 1999 increased by 1.6%. But so far in 1999, the California economy is outpacing the country as a whole, suggesting a somewhat higher "normal" demand growth for that state. Employment in California is up 2. 9% for the year through October versus a national increase of 2.2% while state personal income in the second quarter (the latest available) is up 6.7% versus a national gain of 5.4%.

the average inflow from other PADD's rose from 74 to 97. Imports came from as far away as South Korea, Singapore and Finland.

The sustained increase in supplies from elsewhere was a significant market response to the initial widening price differentials between PADD 5 and the rest of the country. The incentives created were strong enough to overcome the higher costs of producing and shipping the special product required by the region. Overall, total supplies of finished gasoline in PADD 5 in the first nine months were actually higher by 1.5% versus a year earlier despite the decline in local production (which in 1995-98 accounted for 94% of total supply in the region). The rise in product inflows, with a especially strong surge in April (when imports reached 83 thousand barrels/day) helped bring prices down from their early April peaks and moderated the price impact of the refinery problems that developed later in the spring and summer.

Concluding Notes

Overall, market forces appear to have worked, although under the special handicaps associated with California's relative insulation from gasoline markets elsewhere. Initially higher prices attracted new supply and dampened demand, which subsequently moderated prices later in the face of new problems with local production. Allowing market forces to operate meant supply and demand remained in balance, that is to say, at all times consumers could buy what they wanted at prevailing prices---even if they didn't like the prices they had to pay.

As the supply situation improved, prices eased to within about 10 cents/gallon of PADD 1 levels---and national average levels. A differential of this magnitude is about in line with what would be expected in a normal supply situation given higher average taxes in California of about 5 cents/gallon plus estimated higher costs of producing CARB gasoline of between 5 and 8 cents a gallon[12].

[12] As cited by the US Energy Information Administration in its **Assessment of the Summer 1997 Motor Gasoline Price Increase,** May 1998. Costs of CARB gasoline are discussed in Appendix B, entitled, "Why do Prices Vary Regionally? California Case Study."