2008 Report on the Hawaii Petroleum Market under the Petroleum Industry Monitoring, Analysis and Reporting (PIMAR) Program

November 7, 2008

Redacted

Submitted to:

Hawaii Public Utilities Commission
Honolulu, Hawaii

Submitted by:
ICF International

[This page is intentionally blank.]

PIMAR REPORT FOREWORD

In this report, the Hawaii Public Utilities Commission (PUC) reviews the operational and pricing data submitted to the PUC by the oil industry in Hawaii, as required under Act 78 of the Hawaii Legislature. The PUC retained the services of ICF International (ICF) to assist in the compilation and analysis of the data. The period of the study extends from the initiation of the Gas Cap (September 1, 2005) to June 30, 2008. This report extends the initial report filed November 7, 2007.

The information contained in this report is highly confidential in nature, since it includes specific price data from petroleum fuels transactions, as well as data on margins and volumes from all industry participants in Hawaii. The amount of data presented is extensive, and the amount of data submitted and reviewed is much greater. There are several important issues that the reader must recognize in reviewing this report:

a. This report includes the first 18 months of data reporting under the Petroleum Industry Monitoring, Analysis, and Reporting (PIMAR) Program. The data collection process is continuing to evolve, and there are clearly areas for improvement in defining information needs as well as consistency and accuracy of data submitted.

b. It is very easy to come to incorrect conclusions without understanding all the factors around any numbers presented. The amount of information provided is extensive, and can easily be misrepresented, or misinterpreted without great care to insure that all price and volume information are properly compared, aggregated, and analyzed.

c. The PIMAR data are used for all pricing and most volume information provided related to the petroleum industry companies in Hawaii. In some isolated cases, anomalies in the data reported (missing data, etc), ICF, with the Commission's approval, used Data from the Energy Information Administration (EIA) for import verification, and from the Hawaii Department of Business Development, Economics and Tourism (DBEDT) for utility energy consumption data. These issues will be resolved with the parties for future reports.

d. This comprehensive report, as noted, contains extensive amounts of confidential information. Due to the limited number of market participants in Hawaii, both in refining and in the supplier & jobber categories, the public redacted report requires that a great deal of information must be masked or excluded to avoid providing any competitive insight to market participants.

This report is the mechanism used to report on the oil industry to all parties in the state. Act 78 provided funding and instructions for the PUC to establish the PIMAR program to monitor and report on the oil industry in Hawaii. The intent of this portion of the Act was to replace the Gas Cap with an improved transparency tool for the state to use to monitor the oil industry in Hawaii.

As will be described in the report, this effort serves both to report on the oil business in Hawaii over the past three years and to identify the longer term needs of the PIMAR process to monitor the industry more effectively and efficiently.

[This page is intentionally blank.]

TABLE OF CONTENTS

[This page is intentionally blank.]

LIST OF EXHIBITS

Executive Summary

This is the second report by the Hawaii Public Utilities Commission (PUC) of the operational and pricing data submitted to the PUC by the oil industry in Hawaii, as required under Act 78, Session Laws of Hawaii 2006. Act 78 provided funding and instructions for the PUC to establish the PIMAR system to monitor and report on the oil industry in Hawaii. The intent of this portion of the Act was to provide an alternative to gasoline price controls by establishing a mechanism to improve the transparency of the petroleum business in the state of Hawaii.

Report Development

This report and analysis was developed using a significant amount of data from the petroleum industry in Hawaii over the period from September 2005 through June, 2008 (Study Period). The primary data sources include 1) the PIMAR data reporting system, including the gasoline transaction database established by the PUC following implementation of the Gas Cap legislation in 2005, 2) the oil industry data collection process established by the Department of Business, Economic Development and Tourism (DBEDT) well before the gas caps were established (called Initial Petroleum Information Reports (IPIR) in this study) and 3) Data from the U.S. Energy Information Administration (EIA) as well as market pricing data from the Oil Price Information Service (OPIS) and Platt's Oilgram Pricing service.

The data available for analysis represents an extraordinary amount of information on volumes, prices, margins and market conditions that was accessible for the report. This year's report includes information on product inventory levels and supply and demand balances which was not possible for last year's report due to insufficient data from the IPIR system. The analysis with essentially all PIMAR data from January 1, 2007 did identify additional data collection anomalies which need to be resolved with the Commission and the reporting parties to further improve the integrity of the report.

The data provided by the parties to the PUC in all areas represents extremely confidential information which must be protected from public disclosure. Accordingly, this report was developed as presented here with full disclosure of confidential information. This report will be provided to the Commission for their use. A redacted report will be made public which will provide non-confidential sections of this report. To the degree possible, the Executive Summary will attempt to present results with a minimum of redactable data.

This report conveys information on the Hawaii Petroleum Market, assessment of prices and margins for gasoline and other products, comparison of Hawaii refiner/marketer profits with major domestic refiner/marketer and potential impact of new legislation on the petroleum industry in Hawaii. It should be noted that this report does not include a detailed assessment of financial data for the refiners (Chevron and Tesoro) or major suppliers (Aloha, Mid-Pac and Shell) for 2007. The parties provided financial data for FY 2006 and FY 2005 (suppliers only) which was analyzed and reported to the Commission in 2008 subsequent to the initial PIMAR report in November 2007 (Profit Report). Financial data for FY 2007 has not been provided yet for analysis.

While the Profit Report has not been formally published in redacted format, the preliminary findings in the report indicate that profit levels for Hawaii refiners in 2006 were very weak, in

particular compared to major domestic refiners who were enjoying record profits in 2006. Profits for suppliers (who provided data for both 2005 and 2006) on a preliminary basis varied from [redacted] in 2005 to before tax profit levels of [redacted] in 2006 [redacted] While the report has not yet been issued in a redacted form, ICF believed this context was important perspective in understanding the impact of trends in 2007 through mid-2008 and in the future on the petroleum industry included in this report.

Major Conclusions

There are a number of important results in the 2008 PIMAR report which are presented in the Executive Summary and in the body of the report. However there are a few significant conclusions that should be identified. These are:

1. The prices Hawaii consumers are paying for gasoline are determined by global gasoline markets, but influenced by Hawaii market conditions. Since suspension of the gas caps in May 2006, wholesale gasoline prices in Hawaii have remained relatively close or below prices had the gas caps stayed in place.

2. The PIMAR system still has some data and category issues to resolve, but it appears that the reporting and visibility of petroleum market information to the Commission has provided a transparency and watchdog role that was absent in the past. There do not appear to be any aberrant pricing activities by any of the reporting parties in Hawaii (aberrant meaning excessive and inexplicable pricing increases) over the study period.

3. The weak competitive position of the Hawaii refineries is apparent in the relative margins versus the U.S. Gulf Coast refinery margins, and in published data from Tesoro. The preliminary Profit Report results also indicate poor financial performance of the refineries. While the refineries have provided reliable supply to Hawaii consumers, their poor financial performance compared to other refineries in the U.S., as well as other Chevron and Tesoro refineries, is a concern.

4. New and pending legislation in Hawaii (Act 234) and potentially at the Federal level to reduce Greenhouse Gas emissions and reduce carbon content in transportation fuels will (in addition to other legislative initiatives) create significant cost exposure to Hawaii's refineries. As progress is made toward to goal of reducing power generation in Hawaii from fossil fuels, and as refiners incur costs to buy carbon allowances or reduce carbon dioxide emissions, the very weak current refinery margins will erode further.

5. ICF strongly recommends that the Commission consider the full implications of the potential closure of one or both of the refineries in Hawaii. While this may (at this time) be a contingency study, it should be clear that the direction of the GHG legislation in Hawaii and the U.S., the Federal EISA provisions and the recent announcement[1] committing to displace fossil fuels in Hawaii for power generation by 2030 are specifically focused at reducing the use of petroleum based fuels in Hawaii. The current profits of these refineries are poor, and in light of the regulatory issues noted, the question of whether or not one or both refineries will close may be a question of when, not if.

[1] October 20, 2008 Press Release from Governor Lingle's office

Hawaii Petroleum Market over the Study Period

The study period represents a time of significant change in the Hawaii petroleum market as well as global markets. In Hawaii, gasoline price controls were implemented and subsequently suspended. An ethanol mandate was implemented. Significant changes occurred in the required sulfur levels in on-road diesel fuels nationwide. The PIMAR reporting process was initiated. Global oil markets showed sustained escalation in price along with continued volatility in prices stemming from geo-political events, weather issues, and tight refinery capacity.

The key overall observations on the petroleum market in Hawaii over the study period are as follows:

- Hawaii refineries operated well through the third quarter of 2007. Subsequently the Tesoro refinery had operational problems impacting performance in the fourth quarter of 2007. Tesoro in fact released a statement indicating that "The Hawaii refinery posted an $86 million pre-tax operating loss for the quarter compared to a $19 million pre-tax operating profit for the same period a year ago. In Hawaii, finished product prices did not reflect the rapidly rising cost and premiums paid for crude which accounted for most of the quarter to quarter difference. Additionally, an unplanned outage on the refinery's reformer unit during the period negatively impacted results by an estimated $30 million, including $10 million of higher repairs and maintenance expenses".

- In 2008, both refiners continued to experience the impacts of higher crude oil costs and poor margins on their performance. Both refiners reduced crude runs and altered operations to improve financial performance. The crude run reduction did not appear to impact supply to consumers.

- Average crude costs in Hawaii remained significantly higher than the U.S. average crude cost. Hawaii landed crude costs to refiners were as low as [redacted] above the U.S. average to as high as [redacted] above the U.S. average based on monthly averages. This was due to the need to process more expensive lower sulfur and lighter crude oil in Hawaii than the U.S. average, as well as higher freight costs to deliver crude to Hawaii in smaller vessels. This is a significant competitive disadvantage to Hawaii refineries. In 2008, refiners worked to process cheaper, heavier crudes as they reduced their crude throughput. Average Hawaii landed crude cost improved from a disadvantage (on average) of roughly [redacted] to roughly [redacted] compared to the U.S. average landed crude cost in the first half of 2008.

- Hawaii refineries are far less complex than the average U.S. refinery. Hawaii's refineries are configured to meet Hawaii's high demand for residual fuel oil and jet fuel. Gasoline and diesel fuel yields are lower than average U.S. refineries; jet fuel and residual fuel yields are substantially higher. The higher yield of residual fuel penalizes Hawaii refiners further since residual fuel is generally sold at discounts to crude oil price. During the study period, the Hawaii refiners sold residual fuel oil at [redacted] per barrel lower than the crude oil price. This disadvantage increased considerably in 2007 and 2008 as residual fuel discounts to crude became even larger.

- Hawaii's petroleum market requires ongoing imports and exports of petroleum products to balance supply and demand. Gasoline demands require importing of ethanol, and exporting of some gasoline blendstocks. Jet fuel demands require relatively frequent

imports to augment high refinery jet fuel production. Diesel demands require imports of very low sulfur diesel, and exports of higher sulfur stocks. Residual fuel is near balanced with local refinery production.

In 2008, the lower crude runs have significantly reduced the need to export gasoline blendstocks and higher sulfur diesel. Jet imports have noticeably increased (about one third of Hawaii's jet fuel demand is imported). Residual fuel oil has remained balanced despite lower crude runs because the residual fuel yield from the heavier, cheaper crude is higher.

- Inventory levels of petroleum products in Hawaii have been adequate to sustain supply with current demand levels. Generally inventories provide 20-30 days of supply for each major product category. Reliance on imports for ethanol and jet fuel supply must be managed, but apart from low jet inventories briefly after the 2007 Tesoro operational problems, supply of all products has been good.

- Hawaii gasoline consumption has been on an upward trend through mid-2007 averaging 2.5% growth per year since 2000. Hawaii Department of Taxation records for the 2007 Tax year (mid 2007 to mid-2008) show a noticeable decline of over 5% in gasoline demand. This is likely due both to the impact of higher prices and reduced tourism. Consumer demand for premium gasoline has declined from just under 25% of consumption in 2002 to about 16% in 2007.

Assessment of Prices and Margins in Hawaii

The report provides an extensive analysis of prices and margins for refiners, suppliers, jobbers and retailers in Hawaii. These analyses cover both the gas cap period and after the gas caps were suspended, and include, to the degree possible, all major products being sold (gasoline, jet fuel, diesel and residual fuel). Overall, the results of this analysis provide the following key conclusions:

Refiner Prices & Margins

- The analysis indicated that Hawaii refiner margins for gasoline bulk price to suppliers are competitive with other markets considering location differences. Gasoline bulk margins versus crude cost were below similar margins for U. S. mainland refiners. Jet fuel wholesale prices in Hawaii have varied from slight premiums to discounts from the U.S. West Coast market, and are typically at premiums above the Pac Rim market (this provides incentive for jet fuel imports from that region). Diesel fuel wholesale prices have recently (2008) been at discounts, from the West Coast market. Residual fuel (under 1% sulfur) has typically been at premiums to West Coast and Singapore markets, while higher sulfur residual fuel has been at discounts.

- A comparison of Hawaii refiner product gross margins versus landed crude costs over the study period showed a gross margin estimate (based on prices and yields of gasoline, jet, diesel and residual fuel in Hawaii) that was more than [redacted] below the estimated gross margin of a Gulf Coast refiner processing crude in the Gulf Coast with a

typical Gulf Coast full upgrading yield pattern and average landed cost. This margin gap appears to have narrowed by [redacted] in 2008 as Hawaii refiners have taken steps to improve crude costs.

- Overall refineries in Hawaii appear to be selling product to suppliers at prices competitive with prices for those products in other global markets.

Wholesale Prices and Supplier Margins

- Wholesale prices for gasoline in Hawaii are tracked primarily as prices charged by refiners and suppliers for delivery of gasoline to service station dealers and others (military, Costco, etc). These prices are called Dealer Tankwagon Prices (DTW) prices. Data was studied from the gas cap initiation (September 2005) through mid 2008 looking at four discrete periods: Gas Caps, 2006 Post Gas Caps, 2007 and 2008 YTD.

- During the gas cap period DTW prices to service stations tracked the calculated gas cap in almost lock step. Subsequent to the suspension of the gas caps, this study compared DTW prices with the modified gas cap calculation developed by the Commission to reflect the blending of ethanol in gasoline. This comparison indicates that despite the fact that the gas caps were suspended; Hawaii suppliers have maintained DTW prices relatively close to what the modified gasoline price cap would have required. Prices have tended to fall above the calculated cap in falling markets, and fall below the cap in rising markets. However overall refiners and suppliers are maintaining prices at levels at or near where the gas cap would have been.

- DTW prices to service stations outside Zone 1 (Oahu) are all higher than Zone 1 prices reflecting transportation and storage cost differentials versus Oahu. These price differentials have overall been relatively consistent over the entire study period.

- Suppliers have tended to increase DTW price premiums over regular gasoline for premium and midgrade above levels seen during the gas cap period. Initial increases in 2006 and 2007 were substantial but these have gradually been reduced in 2008. Premium grade values over regular in Hawaii appeared in line with the U.S. Mainland premiums in 2008.

- Suppliers have maintained relatively consistent competitive service station DTW pricing over the entire period. Certain suppliers price higher than others and certain suppliers price lower than others. These patterns did not change over the study period.

- DTW sales to other channels such as the Military, Costco and Car rental agencies have typically been at discounts to DTW sales to service stations. These sales channels do not incur extensive marketing costs for refiners and suppliers and therefore can be discounted below service station sales.

- Supplier margins (gross profits) are driven by the spread between their DTW sales prices and the acquisition costs they pay for gasoline from Chevron and/or Tesoro. The report determines service station margins for each supplier in each zone based on specific transactions from the Transaction database.

- Supplier margins to service stations show in most cases the highest margins existed in 2006 following the suspension of the gas caps as global petroleum prices declined significantly. Margins were also good during the gas cap period. In 2007 and most notably in 2008 supplier margins to service stations declined. The decline in 2008 is driven by a weak gasoline market in Hawaii which has kept DTW price increases well below increased global market price increases. Since global market price increases are the basis for supplier's acquisition costs from refiners, their margins have clearly been squeezed in 2008.

- The Supplier gross margins are a key factor in Supplier profitability. While in some cases the outright gross margins appear high, the gross margins drive revenues which must cover all costs of operating the business. Financial results for the Suppliers presented in the unpublished Profit Report for FY 2005 and 2006 indicated that gross margins experienced in 2006 provided a reasonable profit level for Suppliers. Generally declining margins since 2006 likely will result in poorer earnings for these parties.

Jobber Margins

- Jobber margins across all zones tended to range between $0.05/gallon and $0.15/gallon during the gas cap period, with some jobbers increasing their margin by an additional $0.10/gallon or more in the period following gas cap suspension. Individual jobber margins have been consistent over the period, although some jobbers have margins as low as 5 cpg and others as high as 25 cpg over the period. Jobber margins have not appreciably changed in 2008.

Retail Service Station Margins

- Retail service station margins in Hawaii ranged from $0.15/gallon to $0.50/gallon over the study period depending on the zone. The higher margins are in the zones outside of Oahu, with Maui, Hawaii Zone 8, and Lanai being significantly higher than Oahu. Data indicate that these zones also tended to increase retail margins over the period while Zones 1, 2 and 7 tended to have similar retail margins in each of the four study period sectors (Gas Caps, 2006 Post Gas Caps, 2007 and 2008 YTD). Retail margins were not part of the Gas Cap process, and information on retail station costs are not accessible in PIMAR. However, comparison with estimated retail margins in other states would appear to indicate that Hawaii retail margins are about $0.10/gallon above mainland states such as California, Washington and Massachusetts.

Gasoline Market Competitive Comments & Recommendations

The 2007 Report provided ICF responses to three questions raised by the Commission. These were:

1. How can competition in the gasoline wholesale market in the State of Hawaii be increased?

2. How can the pre-tax wholesale price of gasoline in the State of Hawaii be decreased?

3. How can the market or the efficiency of the market for gasoline in the State of Hawaii be improved?

The discussion of these questions is not fundamentally different than last year, and referral to last year's report is suggested. However, based on the additional market events of the past year, ICF has modified several of our recommendations related to possible actions that could reduce the pre-tax wholesale price of gasoline. These modified recommendations are presented below:

1. The primary recommendation is to continue the development of the PIMAR program with a number of modifications as identified in the last section of this report. The transparency that this program can provide will provide significant value over time. Market participants will understand that their actions are being monitored, and will be visible. The report does provide extensive data to make margins visible, and the initial two reports have shown minimal evidence of aberrant pricing behavior by the parties.

2. Continue to have the Gas Cap legislation suspended. Consider recommendations to the legislature for modifications to the Gas Cap factors which will better align gas cap baseline price and location differential to commercial terms. It may be necessary to keep the Gas Cap legislation in a suspended mode (rather than repealing the legislation) as a possible control mechanism if the PIMAR process does not achieve desired results.

3. Emphasize to Hawaii consumers, potentially with support from DBEDT, that use of premium and midgrade gasoline may not be a requirement as per the car manufacturer's driver instructions. Using regular gasoline may save many consumers unnecessary expense.

4. Emphasize to consumers that continued actions on their part to reduce gasoline consumption have a clear impact on the market price. The evidence in Hawaii is best seen by the weak DTW prices in 2008 versus spot market prices on the West Coast, Gulf Coast and Singapore. Lower demands works to deliver lower prices in any market.

5. Achieve a better understanding of the costs of the wholesale supply business in Hawaii. The supplier margins are being squeezed in 2008, but have been high in prior periods. As noted, there is minimal incentive for any supplier to push prices lower to improve market share. Gross margins appear even higher in most zones outside Zone 1, but costs are also greater in most cases. (the Profit Report submitted in 2008 shows cost profiles for the reporting parties which appears to confirm relatively high costs are required to operate the business in Hawaii, but more data reporting on costs would be helpful)

6. Retail service station margins in Hawaii in all zones appear to be quite a bit higher than several mainland states, with many zones outside Zone 1 again having much higher margins. While analyzing retail a margin was not an object of the PIMAR process, a better understanding of the need for higher retail margins should be explored.

Prices for Jet Fuel, Diesel and Residual Fuel Oil

- These products are significant components of the Hawaii industry, in some cases even more critical than gasoline. Demands for jet fuel and residual fuel are greater than gasoline, and diesel fuel demands are about two thirds of gasoline. Data provided in the PIMAR system (W-130 Report) indicates that the prices being achieved by the refiners and suppliers in Hawaii for these products are generally well in line[2] with competitive prices for similar grade products in more liquid market centers (Gulf Coast, West Coast, Pac Rim).

- The availability of actual sales prices for all volumes of jet fuel and diesel fuel is not entirely visible in the W-130 data. Jet volumes sold through the Hawaii Fuel Facilities Company in Honolulu do not have prices reported, and diesel sales to utilities do not appear to be reported

Comparison of Hawaii Profit Estimates to U.S. Downstream Refiner/Marketers

ICF aggregated profit information from six major U.S. Refiner/marketers in the 2007 Report from 10-K and Annual Reports. Their profit information on their domestic refining and marketing business is shown below over the 2002 to 2007 timeframe (this chart updates the table in last year's report to include 2007 results). Charts shown for Chevron and Tesoro are based on their entire U.S. system.

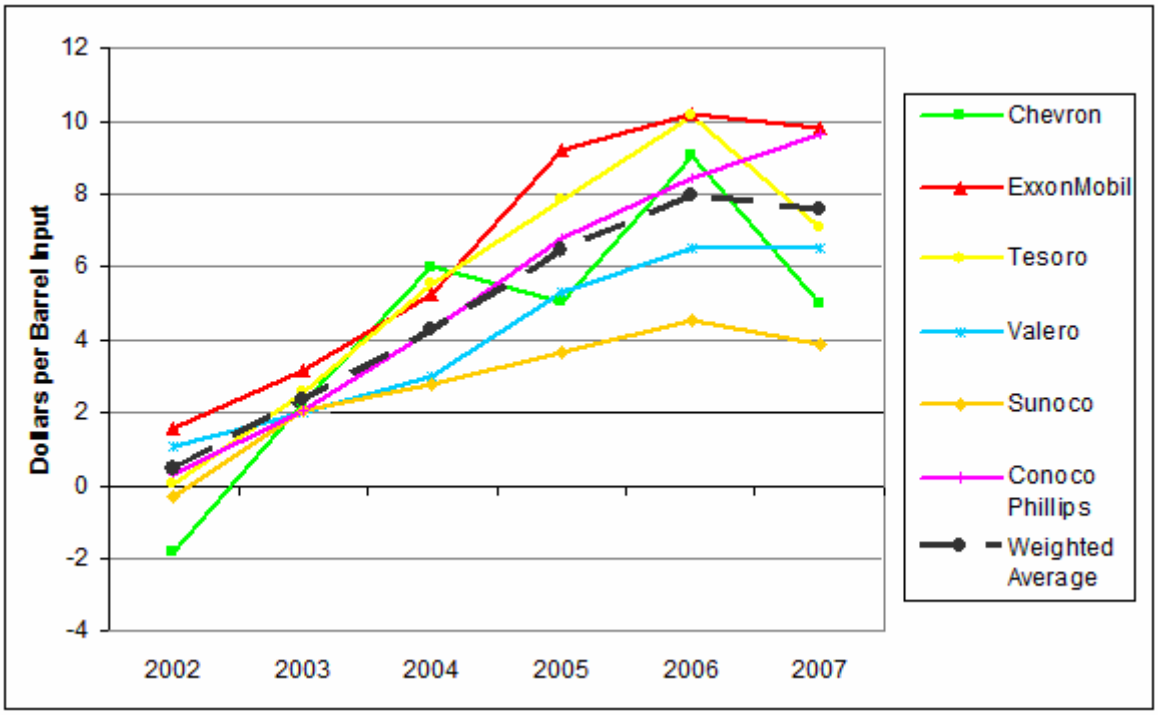
The chart shows that refiner /marketers had low earnings early in the period and high earnings in 2005 through 2007, with profits declining in 2007.

The data provided by Chevron and Tesoro for the unpublished Profit report enabled an estimate to be made for the 2006 profit level of the Hawaii refineries. This information is not a rigorous financial analysis, but does provide a complete assessment of both gross and net margins for the refining/marketing business.

The single data points labeled Chevron and Tesoro in 2006 show how these refineries compared with the rest of U.S. refining and marketing. The very poor profits in a year while overall refining companies were making record earnings indicates the Hawaii refineries are struggling. Margin trends in 2007 and 2008, coupled with inherent crude cost disadvantages and Tesoro's comments on 2007 fourth quarter performance indicate that these refineries are fighting an uphill battle to stay competitive.

[2] "Well in Line" means that the wholesale prices in Hawaii appear logical based on spot market prices in other regions plus consideration of transportation cost differences.

U.S. Refiner/Marketer Before-Tax Profits



Source: SEC 10-K and 10-Q Filings

Potential Impacts of Federal and State Policies upon Supply and Pricing of Petroleum Products

The 2007 PIMAR report discussed a number of Federal and State policies and regulations that either have or potentially could impact the petroleum market in the State of Hawaii. In this section ICF will focus on several specific new policies or legislation that have been either passed or imposed since the 2007 report. These actions (which were discussed as possible actions in the 2007 report) deserve some specific discussion that the Commission and other stakeholders may wish to consider:

- The passage of the 2007 Energy Independence and Security Act (EISA) mandated increased use of ethanol in gasoline as well as use of other biomass based products. It also increased vehicle CAFE standards (mileage per gallon) from 25 mpg currently to 35 mpg by 2020.

- Hawaii Act 234, signed into legislation in 2007, mandates a reduction in Greenhouse Gas (GHG) emissions to 1990 levels by 2020. There will also likely be Federal legislation implemented over the next few years to reduce GHG emissions and move toward low carbon fuel standards (LCFS) in transportation fuels.

  More specifically, the recent announcement of Hawaiian Electric (HECO) that commits to not build any new coal plants, integrate up to 1,100 megawatts of renewable energy into the power grid and convert existing fossil fuel generators to biofuels using locally grown

crops, is a major initiative. This announcement is linked to the effort to create 70 percent of Hawaii's energy use from clean energy sources by 2030.

The commitment to move Hawaii in this direction is huge, and has significant ramifications for the petroleum industry. The practical ability to implement the change being considered will certainly be studied from both technical and economic perspectives. However, assuming that this goal is in fact realized, as well as the implementation of increased ethanol use, higher CAFE standards and control of CO2 emissions from refineries, the petroleum industry impacts would include the following:

a. The reduction in use of residual fuel oil and diesel fuel for power generation will eliminate a significant outlet for Hawaii's refinery product. The alternative to sales of these products to utilities or other power generators (which amounted to over [redacted] of 2007 refinery output) would be to either reduce the volume of crude processed or sell the surplus fuel into the global market. Reducing crude runs would lower gasoline and jet fuel production as well, and runs could not be lowered enough to eliminate the need to export residual fuel. Practically then, if the refineries continue to operate, it will be necessary to export both residual fuel and diesel in significant volumes from the Port of Honolulu to balance supply and demand.

b. Higher ethanol usage and higher CAFE standards will drive lower consumption of petroleum based gasoline, which is an objective of these programs. The lower petroleum based gasoline demand will result in excessive supply of gasoline in Hawaii which will require either reduced crude runs or exports of gasoline to balance supply.

c. Potential Federal requirements to control CO2 combustion emissions from the refineries may necessitate that the refiners 1) purchase carbon credits; 2) invest to capture and sequester combustion CO2 emissions; or 3) reduce production of combustion CO2. Carbon credit costs and investment costs for Hawaii's refineries will be very expensive and result in poorer refinery profits unless prices of all petroleum products are increased to pass on the costs. The option to reduce CO2 emissions can most easily be met by shutting a refinery down.

The net effect of these changes from the perspective of the Hawaii refiners may be that there is minimal outlook for a reasonably profitable future. The weak earnings in 2006 and, apparently in 2007 while other refiners were making strong income levels are a poor base to tackle some major issues that will further erode profits. The fact that current refiner profit levels in Hawaii are very poor and that the future outlook for demand for products is very weak is a significant concern. Furthermore, since potential Federal GHG reduction requirements will likely not be state-specific, Chevron and Tesoro may evaluate the option of closing Hawaii refineries to help them meet overall Federal GHG reduction targets.

Introduction

ICF International (ICF) has been working at the request of the Hawaii Public Utilities Commission (PUC) to develop the 2008 report on the status of the petroleum industry in Hawaii under the Petroleum Industry Monitoring and Reporting (PIMAR) program. The PIMAR program, enacted on May 5, 2006 under Act 78, requires the PUC to implement a process to obtain information from the oil companies and other relevant parties in Hawaii so that the prices, volumes, margins and profits of petroleum companies in Hawaii become more transparent.

The specific requirements for this study as outlined by the PUC include the following:

1) *Analyzing and interpreting information and data reported to the State by reporting companies, including petroleum industry distributors, and other petroleum industry participants, under HRS Chapter 486J, including HRS §§ 486J 3, 486J 4, and 486J 4.5.*

2) *Analyzing and interpreting any other necessary and relevant information obtained by the State relating to the supply, prices, margins, and profits of petroleum products, with particular emphasis on motor vehicle fuels that are manufactured or compounded, imported or exported, and sold, exchanged, or otherwise transferred or used in the State of Hawaii. The information analyses and interpretation shall include, but not be limited to:*

    a) *The nature, cause, and extent of any petroleum or petroleum product situation or condition affecting supply, price, margins, or profits;*

    b) *The prices, with particular emphasis on wholesale and retail motor vehicle fuel prices, and any significant changes in prices charged by the petroleum industry for petroleum or petroleum products sold in Hawaii and the reasons for the changes;*

    c) *The income, expenses, margins, and profits in Hawaii, both before and after taxes, of each distributor and the income, expenses, margins, and profits, both before and after taxes, of major oil companies in other regions of the United States and other countries; and*

    d) *The emerging trends relating to supply, demand, price, margins, and profits.*

3) *Analyzing the effects of state and federal policies, rules, and regulations upon the supply and pricing of petroleum products.*

4) *Analyzing Gasoline Transactions in Hawaii over the Study Period, to address the following questions:*

    a) *Comparison of gasoline prices in Hawaii to the gas caps, both during the Gas Cap period and after the Gas Cap was suspended*

    b) *Identification of actual margins for the suppliers (who buy from refiners) and jobbers (who buy from suppliers and refiners) in Hawaii based on data reported to the PUC*

    c) *Identification of retail service station margins for gasoline dealers in Hawaii*

5) *Provide recommendations on the following:*

   a) *How can competition in the gasoline wholesale market in the State of Hawaii be increased?*

   b) *How can the pre-tax wholesale price of gasoline in the State of Hawaii be decreased?*

   c) *How can the market or the efficiency of the market for gasoline in the State of Hawaii be improved?*

The report below provides information that addresses most of the above issues. The PUC requested a complete assessment of the gasoline prices in Hawaii under Item 4 above to specifically address concerns about the prices in Hawaii both under the Gas Cap law and after the law was suspended. This analysis also incorporated a review of wholesale and retail margins. The report therefore focuses more extensively on gasoline than other products. Additionally, the report describes the development process and identifies a number of recommendations for the PUC to consider to enhance the effectiveness and efficiency of both the development of the report as well as petroleum industry monitoring processes. The structure of the report as outlined in the table of contents is repeated below:

1) Report Development Process
   a) Report Time Period
   b) Source of Data for Analysis
   c) Organization of the Data
   d) Data Analysis Approach

2) Description of the Petroleum Market in Hawaii over the Study Period
   a) Hawaii Market Background
   b) Overview of Petroleum Market Structure in Hawaii
   c) Overview of the Petroleum Supply Chain
   d) Hawaii Crude Oil Supply & Costs
   e) Refinery Operational Analysis
   f) Key Product Supply and Demand
   g) Key Product Inventory Trends
   h) Import and Export Analysis

3) Assessment of Gasoline Prices and Margins in Hawaii:
   a) Gasoline Price Analysis
   b) Gasoline Supply Chain & Classes of Trade
   c) Hawaii Prices vs. the Gas Cap

d) Supplier & Jobber Margins
e) Retail Service Station Margins
f) Gasoline Market Observations and Issues

4) Assessment of Other Prices & Margins in Hawaii
   a) Jet Fuel Price Analysis
   b) Diesel Fuel Price Analysis
   c) Residual Fuel Price Analysis
   d) Refinery Gross Margin Estimation Over the Study Period

5) Comparison of Hawaii Profit Estimates with U.S. Domestic Downstream Refiner/Marketers

6) Potential Impacts of Federal and State Policies upon Supply and Pricing of Petroleum Products

7) Future Report Enhancements

8) Glossary

9) Appendix

[This page is intentionally blank.]

1 Report Development Process

Report Time Period

This report requires analysis of petroleum markets in Hawaii beginning with the implementation of the Gas Caps in September 2005. The report focuses on the gasoline market, and also reports on all other major petroleum products in Hawaii.

The Hawaii gasoline market can be divided into three discrete time periods for the purpose of understanding the pricing mechanisms adopted by suppliers and distributors:

1. Period before September 1, 2005 (Pre Gas Cap period): The wholesale gasoline market in Hawaii before September 1, 2005 was unregulated and the prices were set purely by market forces similar to all markets on the mainland U.S. During this period the gasoline sold was required to be of the conventional variety similar to that on the mainland. The Parties were not required to submit any business data to the Commission during this period. Therefore, the margin analysis presented in this report does not include any information on the pre- gas cap period.

2. Period from September 1, 2005 to May 5, 2006 (Gas Cap period): During this period wholesale gasoline price caps were in effect in the state of Hawaii. All refiners, suppliers and distributors could sell gasoline to other resellers such as service stations, hypermarketers, the military, etc., at a price which was not to exceed the weekly published cap.

3. Period from May 6, 2006 to the present (Post Gas Cap period): In accordance with the Hawaii legislature's decision, known as Act 78 signed on May 5, 2006, the Gas Cap law was suspended. After this date, suppliers and distributors were free to set the wholesale gasoline prices as per market forces. The Commission's order on revised calculation of gas caps reflecting ethanol blending (E-10 gasoline) was issued on May 3, 2006, just before the law was suspended by Act 78. The Commission never published the caps using the new E-10 formula that was established by Decision and Order No. 22451 but continued to calculate them for PIMAR monitoring purposes. The E-10 formula is reflected in the gas cap calculation for the post- gas cap period.

Act 78 also authorized the Commission to monitor and report on Hawaii's fuels markets, expanded the range of data that the oil industry is required to report in HRS 486J-3, 4 and 4.5, and to implement a program (PIMAR) to monitor the actions and pricing of the oil industry in the state to increase transparency. Under the law the Governor has the authority to reinstate the caps if it is determined that it will be beneficial to consumers.

Source of Data for Analysis

The major sources of data to perform the market analysis in Hawaii are noted below:

- Data provided under the Petroleum Information, Monitoring & Reporting (PIMAR) Program. Reporting parties are required to submit PIMAR data from January 1st, 2007 on an ongoing basis. Gasoline transactions as well as all other petroleum product information in Hawaii are included in PIMAR data.

- Transaction data reported to the PUC for all wholesale gasoline sales in Hawaii under the original Gas Cap legislation and under the PIMAR program for 2007 (Reports M-100 and M-101). These data are referred to as the "PUC Transaction Database". These transactions include all sales from refiners to suppliers, suppliers to jobbers, and all sellers to retail service stations (with the exception of company owned and operated stations).

- Calculated gas caps history provided by the PUC for each zone and grade of product during the original Gas Cap period (September 1, 2005 through May 5, 2006)

- Calculated gas caps provided by the PUC for the period May 6, 2006 through June 30, 2008 based on the revised Gas Cap formula under Decision and Order No. 22451 (published but not implemented due to suspension of the caps under Act 78).

- Data provided by certain Distributors to the Hawaii Department of Business, Economic Development and Tourism (DBEDT) under forms prescribed by DBEDT. These data had been collected by DBEDT and were provided to ICF to provide historical data back to the initiation of the Gas Caps. These data will be referred to as "Initial Petroleum Information Reporting" (IPIR) for this report. Data is included for all petroleum products in Hawaii as part of IPIR.

- Data provided by the Oil Price Information Service (OPIS) on the retail prices (including taxes) at approximately 130-170 service stations in Hawaii on a daily basis over the study period. These prices include a number of company owned and operated stations.

- Other data used in this analysis were secured from the U.S. Energy Information Administration (EIA) and other sources (for example, Platt's) referenced in the report.

The data evaluated in the study covered information transactions from Sept 1, 2005 when the Gas Cap Law took effect till June 30, 2008, the latest available date of data before the start of the analysis. This period will henceforth be called the "study period" in this report.

Organization of the Data

PUC Transaction Database: The data in the PUC transaction database was a primary source of analysis for gasoline price and margins. Each transaction had the following information associated with it:

- Date of transaction
- Zone number (1 to 8) in which the transaction took place
- Volume of regular, midgrade and premium gasoline supplied in the transaction (gallons)
- Pre-tax price of the regular, midgrade and premium gasoline supplied in the transaction ($ per gallon)
- Name of Supplier
- Name of Purchaser
- Type of sale (Bulk, Rack, DTW, Retail)
- Invoice/Order Number

The data was organized into two transaction types, purchases and sales. The purchase transaction involved oil companies that bought gasoline from refiners or other oil companies. Most of these transactions were in the bulk category.

The sales data included transactions from oil companies to re-sellers and end-users. Re-sellers include jobbers, service stations, Costco and other wholesalers. End-users include large purchasers of gasoline like military bases and some small consumers who buy directly from the suppliers or jobbers rather than through a service station.

Both data sets were organized to provide segregation of data based on zone, buyer/seller, grade, price, price basis (bulk, rack, DTW, etc).

IPIR Data: Data provided by the Parties in this database included information on refinery input and production, inventory, sales data (volumes and pricing), and imports and exports. The data includes many of the information categories included in the new PIMAR reports, however there are significant gaps in data from time to time and in certain categories.

The IPIR data was segregated into files which permitted aggregation and analysis over the study period. Since the IPIR reports did not collect data from some stakeholders (such as the Hawaii Fueling Facility Company at the airport, and Utilities), is missing some data from refineries (production of HIBOB following the ethanol mandate implementation), and has numerous instances of data entry errors, the data was carefully reviewed prior to use in the study.

PIMAR Data: The data submission requirements for Parties under the new PIMAR reporting system required initial submissions to the PUC beginning on August 22, 2007. The reports provided by the parties have been collected on an ongoing basis since that time, including reports retroactive to January 1, 2007. The 2007 report required the use of IPIR data for a number of the exhibits since the retroactive data was not fully entered before last year's report

was due. This years' report updates exhibits as needed to incorporate the PIMAR data from January 1, 2007.

Data Analysis Approach

The 2008 report utilizes PIMAR data from the W-Series reports (weekly reports on imports, exports, inventory, sales, refinery production and gross margin) for a significant portion of the analysis from January 1, 2007. The primary data used for the gasoline price caps and margin analysis presented in this report were the PUC Transaction Database as defined above. The PIMAR M-100 and M-101 forms contain identical data from Jan 1, 2007 onwards.

Information presented before January 1, 2007 was developed as part of the 2007 report and was not modified for the new report.

The 2007 report had a significant focus on the transition from a gas cap environment and the effect on wholesale and retail prices and margins. The 2008 report analysis continues to focus on the comparison of prices in a non-gas cap marketplace, but also expands information on topics such as inventory trends and supply and demand balances to provide more descriptive information on the petroleum market. This is possible due to the available information in the PIMAR system.

Gasoline Margin Analysis Methodology[3]

The analysis of gasoline transactions and the task of showing average trends over two distinct time periods — period when the Gas Cap was in effect and the period after it was suspended — presented the following challenges:

1. The gas caps changed weekly as the baseline price calculated from the average of three mainland U.S. spot gasoline prices changed everyday and the baseline price was re-calculated every week.

2. The State of Hawaii is divided into eight zones for the purposes of petroleum market reporting. One of the components used to calculate gas caps is the zone adjustment factor which is different for each zone resulting in different gas caps for different zones during any given week.

3. Ethanol was introduced into Hawaii gasoline making it necessary to include ethanol prices into the gas cap. Therefore, Decision and Order No. 22451 altered the formula of gasoline price cap to include a 10% ethanol component and estimate the price cap for E-10 gasoline. A blending credit of 51 cents per gallon (cpg) was made available for suppliers who blended ethanol and sold E-10 gasoline. The zone adjustment factors were also altered.

4. Retail E-10 gasoline sales were exempt from the general excise tax (GET) for part of the study period. The exemption was effective from April 1, 2006 through December 31, 2006. The 4% GET was reinstated on January 1, 2007. In addition, the City and County

[3] This methodology is consistent with the approach in the 2007 report.

of Honolulu began to levy a 0.5% county surcharge on the GET on January 1, 2007, bringing the GET for Oahu to 4.5%. The ethanol exemption again took effect on July 1, 2007.

The changes taking place in the gas caps due to the numerous factors mentioned above presented a serious challenge when trying to develop a methodology for equivalent comparison of transactions by different parties in different zones and different time periods (although the GET issue only affected retail sales). In order to normalize the data for all the changing variables, ICF elected to make the analysis based on the price difference between a given transaction price and the gas cap it was subjected to. This price difference was calculated as follows:

1. Every transaction was assigned the applicable gas cap based on the date of transaction, the zone it took place, and the grade of gasoline.

2. The difference between the transaction price and the gas cap for each transaction, henceforth referred to as 'price spread', was calculated. A negative difference implies that the transaction took place below the cap and a positive difference implies that the transaction took place above the gas cap.

3. The price spread for each transaction was weighted by the transaction volume when estimating the weighted average spread for a given week, or month, or zone, or a combination thereof.

A big advantage of normalizing the data and using the 'price spread' was to allow comparison of transactions when the gas caps were in effect to transactions when the gas caps were no longer in effect. The periods where the Gas Cap was suspended (after May 5, 2006) continued to be monitored by the Commission, with Gas Caps calculated under the new terms of Decision and Order No. 22451, which adjusted the gas cap calculation for the costs of procuring and blending ethanol into the gasoline supply in Hawaii.

[This page is intentionally blank.]

2 Description of the Petroleum Market in Hawaii over the Study Period

This section of the report will discuss the overall status of the Petroleum market in Hawaii over the period of study (from the Gas Caps forward). The section presents on a high level basis the overall supply chain in Hawaii, introduces refiners, suppliers, jobbers, etc as well as the supply zones. The primary focus will be a review of volumes and flows of petroleum supply, with some initial pricing discussion. The flow of the section is as follows:

a. Hawaii Market Background

b. Market Participants & Zones

c. Overview of the Petroleum Supply Chain in Hawaii

d. Hawaii Crude Oil Supply & Costs

e. Refinery Operational Analysis

f. Key Product Supply and Demand

g. Key Product Inventory Trends

h. Import and Export Analysis

Hawaii Market Background

Over the past few years global oil markets have shown a relentless drive to higher prices. These changes have been driven by a number of factors, but are primarily evidence of higher global demands for petroleum products as many developing countries, particularly in Asia, enjoy strong economic growth. At the same time, global crude oil production has seen geopolitical disruptions which impact supply in key producing nations, and refining capacity additions have lagged demand growth.

These changes have had an impact on Hawaii as well as other markets. In Hawaii, the changes in price have generated concern among citizens, businesses and legislature. In addition to dealing with the higher global prices, several other events over the past few years have affected the gasoline markets in the State of Hawaii. These events included implementation and subsequent repeal of price caps at the wholesale level, lowering of sulfur levels in gasoline and diesel fuel, mandated introduction of ethanol in gasoline and the implementation of the Petroleum Information Monitoring and Reporting (PIMAR) program.

Each of these transitions has caused an impact on the State of Hawaii as well as the companies that provide petroleum products and consume petroleum products.

Implementation & Suspension of Wholesale Gasoline Price Controls

The wholesale gasoline prices in the State of Hawaii were subject to a gasoline price cap beginning September 1, 2005 as stipulated under HRS 486H and under implementation criteria as defined in Decision and Order No. 21952 on August 1, 2005. The price caps linked the wholesale prices in Hawaii to an average of U.S. mainland prices in New York, the Gulf Coast, and Los Angeles, and included adjustments for freight to Hawaii, a fixed marketing margin, adjustments for premium and midgrade gasoline, and adjustments for transportation and costs to zones outside Oahu. The intent of the price caps was to link Hawaii prices to mainland spot markets and to provide a ceiling on marketing margins to allow refiners, suppliers and distributors to make money above operational and business costs. It was anticipated that this legislation would result in more volatility of prices in Hawaii, but with more assurance that margins for suppliers and jobbers would not become excessive.

The 2007 report showed that the implementation of the gas caps changed the behavior of companies marketing in Hawaii by causing the gasoline price to service stations to change as the calculated gas caps changed. In addition, the disruptions in the U.S. markets caused by Hurricane Katrina at the very exact moment that gas caps were initiated, followed by Hurricane Rita, resulted in extreme volatility in gasoline prices in Hawaii. Moreover, commercial agreements between refiners and suppliers in Hawaii during this period were based on different assessments of imported parity price in Hawaii than the legislated calculation in the Gas Cap formula. The commercial formulas included markets not impacted by the hurricanes (for example, Singapore), which did not experience the significant run-up in prices versus the U.S. Therefore, some suppliers had contracts which enabled them to procure product at prices cheaper than the Gas Cap formula assumed and sell the product at or near the gas caps and earn a higher margin than intended by the legislation.

In addition, in order to protect margins to smaller jobbers who serviced more remote service stations, the Gas Cap Decision and Order allowed zone adjustment factors to reflect the highest trucking costs reported by the parties in each zone. This decision, while necessary to protect smaller jobber margins, allowed parties with service stations located nearer to terminal sources to price customers at or near the DTW price cap and increase margins above the levels intended in the legislation.

Finally, consumers and dealers were able to predict the changes in prices from week to week as new gas cap calculations were published in advance of their implementation. This created some aberrant behavior in the supply chain with consumers and petroleum suppliers changing their buying or selling patterns with advanced insight on price trends.

In summary, the Gas Cap achieved the legislature's goal of controlling gasoline prices to a mainland benchmark. However, the extreme volatility of the mainland prices during this period (both up and down) created some significant problems for Hawaii businesses and consumers. In addition, the Gas Cap price basis of three mainland market prices was inconsistent with the commercial terms between Hawaii refiners and suppliers, creating higher or lower supplier margins than intended by the legislation. Suppliers and jobbers also tended to price close to the allowable gas caps for service station sales and often moved service station prices in step with gas cap changes.

Implementation of Ethanol Mandate

At the same time as the gas caps were implemented, refiners, suppliers and jobbers in Hawaii were working to prepare for the implementation of ethanol in gasoline in 2006. The state law Section 486J(10) of the Hawaii Revised Statutes and rules in Chapter 15-35 of the Hawaii Administrative Rules, required parties to sell at least 85% of their gasoline in Hawaii with 10% ethanol by April 2, 2006. This product is called E-10. This mandate required refiners and suppliers to procure ethanol from foreign sources, modify terminal and service station equipment and tankage, and modify refinery processes for blending gasoline. Since ethanol must be maintained and shipped separately from gasoline[4], it was necessary to develop two parallel supply chains in Hawaii; one for ethanol and one for the gasoline blendstock, called HIBOB. These products are blended at terminals then transported, via delivery trucks, to service stations. The conversion to ethanol involved added costs to refiners, suppliers and jobbers. These added costs were provided to the PUC and were studied to determine how the gas caps should be modified to allow refiners, suppliers and jobbers to recover their costs associated with the ethanol implementation. Recommended modifications were published by the PUC on May 3, 2006 (Decision and Order No. 22451) for implementation into a revised Gas Cap formula.

At about the same time as when the ethanol mandate was implemented, legislation was passed (Act 78) to indefinitely suspend the Gas Cap in Hawaii. May 5, 2006 was the last day on which the caps were effective. At this point refiners, suppliers and jobbers were again free to price gasoline at levels the market would bear, and to attempt to recover the cost of modifications to their systems for ethanol, and for the purchase of ethanol.

Implementation of Sulfur Specification Changes

In addition to the above state-imposed mandates and legislations, refiners and suppliers were required to deal with nationwide regulation changes in the sulfur levels of gasoline and diesel fuel within this same overall time period. Gasoline sulfur levels have been reduced in a phased manner over the past few years, but are now set at 30 ppm (parts per million) sulfur for all gasoline produced and imported. Diesel fuel sulfur levels for all on-road usage have been at 15 ppm since June 1, 2006, and off-road diesel's maximum sulfur level was reduced to 500 ppm as of June 1, 2007. The impact of this legislation on Hawaii has been to alter the operational performance of the refineries, with some increases in export of unfinished refinery stocks, and limitations on the range of crude oils processed.

Implementation of PIMAR Program

Act 78 also provided funding for the PUC to establish the PIMAR program to monitor and report on the oil industry in Hawaii. This report is the second report developed to report on the oil industry to all parties in the state.

[4] The affinity of ethanol for any trace amounts of water in gasoline requires that the ethanol be transported and stored separately from the gasoline blendstock that it is to be blended with (otherwise the trace water amounts in gasoline will extract ethanol from the gasoline). Ethanol and gasoline are only blended into the delivery truck to the service station. Consequently, separate storage tanks, barge compartments, etc., are necessary components of a gasoline/ethanol based gasoline marketplace.

The intent of this portion of the Act was to replace the Gas Cap with an improved transparency tool for the state to use to monitor the oil industry in Hawaii. While the report does require significant work and resource cost on the part of oil industry parties in Hawaii to provide data in a timely manner to the PUC, the primary benefit of this process to the state will be as an ongoing watchdog tool.

The information contained in the 2007 report and the 2008 report indicate that the elimination of the gasoline price controls and implementation of the PIMAR system has, through mid-2008 not resulted in petroleum industry pricing abnormalities. In fact, there is evidence that market conditions have resulted in weaker margins in 2007 and 2008 for refiners and suppliers.

The existence of the PIMAR system is likely not the reason for poorer market conditions for the parties, but the PIMAR system is clearly a tool that can enable to Commission to effectively monitor for cases of price aberration. Hence it may act as a deterrent to parties in the price decision process.

Hawaii Market Background Summary

The petroleum market in Hawaii over the study period has experienced similar volatility in petroleum prices as other regions in the world. This basic volatility has been complicated for both the petroleum industry and consumers by the various legislated changes in Hawaii (Gas Caps, Ethanol, Tax changes, PIMAR), as well as changes driven by the Federal government on sulfur specifications. The changes required from the regulatory perspective have created additional costs for the Hawaii Industry, either in constraints on crude quality (and cost) flexibility, ethanol purchases and investment needs, exports of unfinished products due to capacity constraints, and so on.

Market Participants and Zones

The Hawaii petroleum market is small compared to most markets on the mainland. There are two refineries, both located on Oahu, that supply most of the petroleum products required in the State. The Chevron refinery at Kapolei has a daily crude processing capacity of 54,000 bpd and the Tesoro refinery at Kapolei has a processing capacity of 94,000 bpd.

Zones

For the purposes of the gasoline price controls, the State of Hawaii was divided into eight ‘zones’ based on their geographic location and specific market characteristics. The island of Oahu forms Zone 1 and all the other zones are comprised of the neighbor islands. Exhibit 2.1 gives an overview of the zone definitions.

Exhibit 2.1 Definition of Zones under PIMAR and IPIR

Zone	Geographic Definition
1	Island of Oahu
2	Island of Kauai
3	Island of Maui, except the district of Hana
4	District of Hana on the island of Maui
5	Island of Molokai
6	Island of Lanai
7	Districts of Puna, south Hilo, north Hilo, and Hamakua on the island of Hawaii
8	Districts of north Kohala, south Kohala, north Kona, south Kona, and Lau on the island of Hawaii

Consumption of petroleum products in different zones depends on the population and commercial or military facilities located in them. Exhibit 2.2 gives a perspective of the petroleum market size on each of the zones for the key products. The zones with higher consumption have more petroleum market participants. For example, Zone 1 has the highest gasoline consumption and also the highest number of gasoline stations. Jet fuel consumption is mainly limited to Zones 1 and 3 that cater to large commercial jet airplanes. Other zones have smaller volumes reflecting inter-island air traffic.

The data indicate that over 60% of the gasoline sold in Hawaii is sold on Oahu, but, in total 80% of the petroleum products are sold on Oahu. While gasoline prices have the most visibility to consumers, gasoline sales are actually smaller than jet fuel and residual fuel sales levels in Hawaii. Hawaii is the only state where either jet or residual fuel sales are higher than gasoline.

Exhibit 2.2 Average Petroleum Product Sales Volume by Zone, Jan 2007–Jun 2008

(Thousand gallons per day)

Zone	Motor Gasoline	Jet Fuel	Diesel	Residual Fuel Oil	Total
1					**4,035.8**
2					**270.3**
3					**481.8**
4					**1.6**
5					**13.3**
6					**1.8**
7					**208.6**
8					**178.1**
Total	**1,273.8**	**1,635.1**	**731.9**	**1,550.4**	**5,191.2**

Source: PIMAR, PUC Transactions Database, DBEDT and EIA-814

Note: These totals are for illustrative purpose only and may be lower than actual due to missing some weeks for companies that filed data and also because some companies did not file reports at all;
Diesel volume based on 2007 data only

Overview of the Petroleum Supply Chain in Hawaii

Oahu, with its two refineries and large marine import facilities at Barbers Point and Port of Honolulu, acts as the hub for the petroleum supply chain in Hawaii. Along with production and import capabilities, Oahu also has large storage terminals owned by the refineries and suppliers that make up the hub. Petroleum products are distributed from Oahu to the neighboring islands using barges. Gasoline and Diesel sold through the service stations normally moves through one or more wholesale transactions before reaching the service station. A typical supply chain can involve a refiner selling gasoline as a bulk transaction to a supplier, who in turn sells it on a DTW basis to a service station or on a Rack basis to a jobber. The jobber, in turn, sells that product to a service station on DTW basis. The Bulk sales can be made be the refinery supplying product to a terminal in Oahu connected by pipeline, or by a supplier lifting the product at the refinery rack, or a refiner/supplier sending production to another zone on a barge. Refiners and suppliers also send some product directly to the service stations they own and operate without going through intermediate transactions with other supplier or jobbers. The transaction structure for gasoline is shown in greater detail in Exhibit 3.1.

Exhibit 2.3 lists the refiners, suppliers, and jobbers involved in wholesale transactions in the various zones in Hawaii. It also shows the major DTW accounts in the various zones. The military buys gasoline in Zones 1 and 2, whereas Costco stations are located in Zones 1, 2 and 8. Service stations are located in all zones.

Exhibit 2.3 Major Market Participants in the Hawaii Petroleum Market

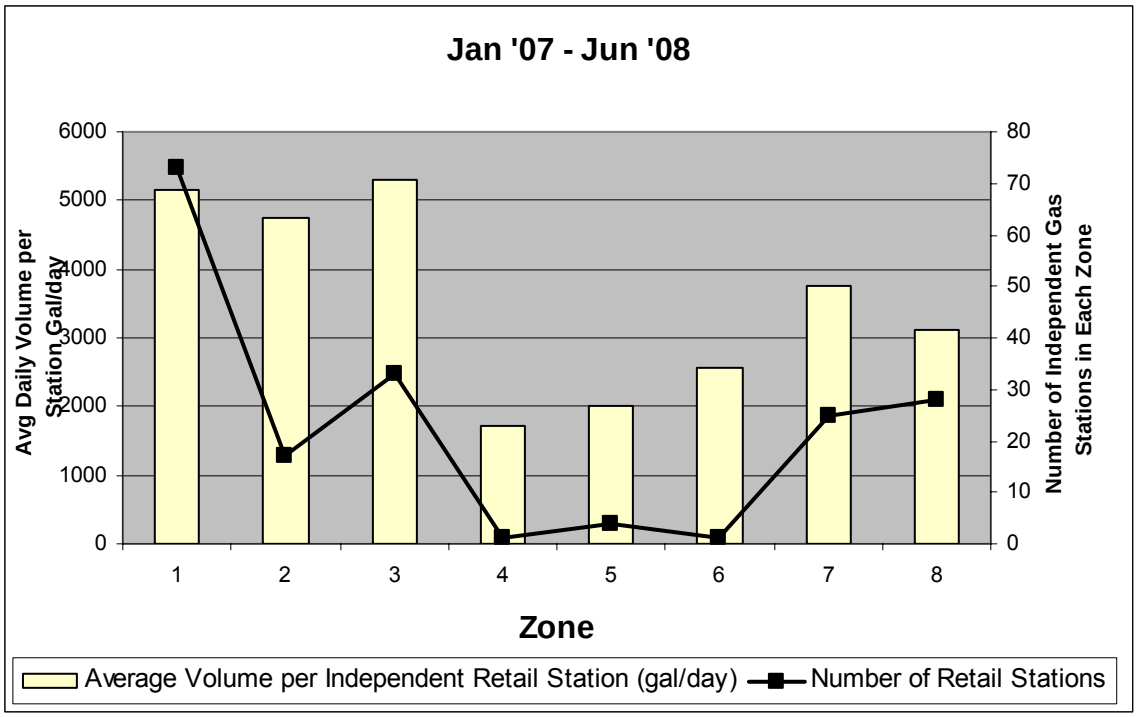
Company	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Refiners	Chevron Tesoro							
Suppliers	Aloha Mid Pac Shell	Mid Pac Shell	Mid Pac Shell				Aloha Mid Pac Shell	Aloha Mid Pac Shell
Jobbers	B&E Petro Garlow	Senter KI	Maui Oil Maui Petro	Maui Oil	Island	Lanai Oil	Akana Hawaii Petro	Akana Hawaii Petro
DTW Accounts								

Transaction	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Bulk Sales								
Rack Sales								
DTW Sales								

Source: PIMAR and PUC Transactions Database

The number of stations and the average volume of gasoline dispensed by each station differs from zone to zone as shown in Exhibit 2.4. Zones 1, 2 and 3 have station throughputs similar to the U.S. average of about 5,500 gallons per day[5]; the other zones are significantly lower.

Exhibit 2.4 Number of Independently Operated Service Stations and Daily Volume Sold by Zone



Source: PIMAR. Jan '07 – Jun '08. Includes retail stations and grades: regular, midgrade, and premium

Hawaii Crude Oil Supply and Costs

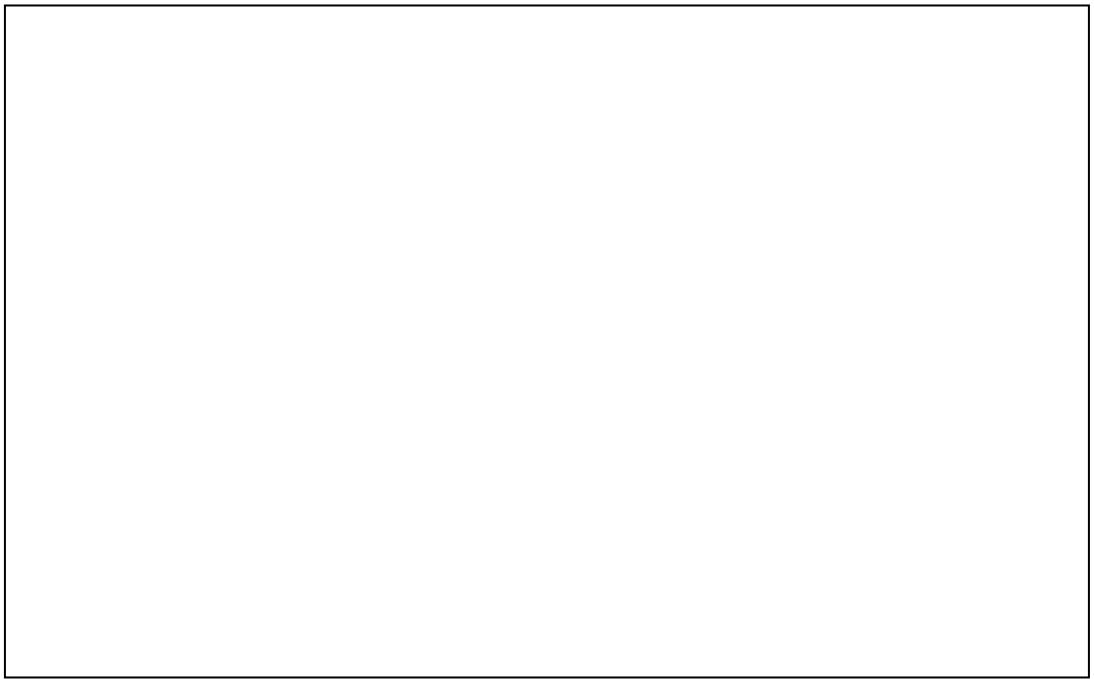
Crude Oil Cost

This section presents Hawaii's crude oil supply and costs over the study period. Hawaii refiners process a light, sweet (low sulfur content) crude mix which is expensive compared to U.S. average crude costs into refineries.

Exhibit 2.5 shows that Hawaii average crude costs ranged between [redacted] per barrel between 2004 and mid 2007. After mid-2007, Hawaii crude oil costs increased significantly through the end of the study period. [redacted]

[5] Based on data from EIA, gasoline demand has averaged about 9.2 billion gallons per year, and service stations number about 167,000.

Exhibit 2.5 Hawaii Landed Crude Costs



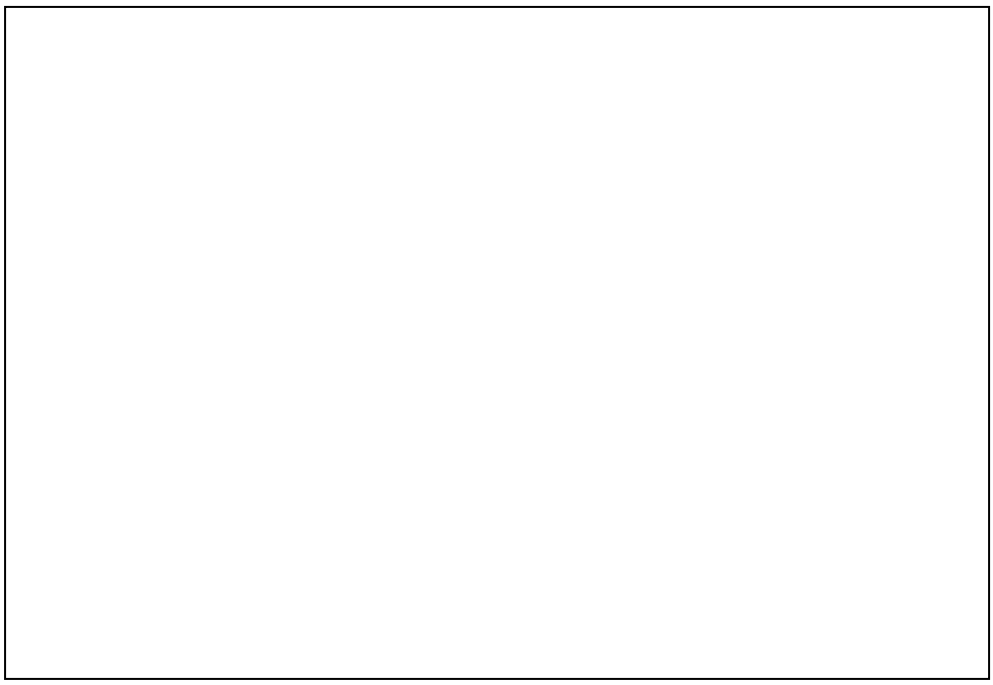
Source: IPIR and PIMAR

Exhibit 2.6 compares Hawaii's average crude cost with the U.S. benchmark West Texas Intermediate crude (WTI), as well as the U.S. average landed cost of all crude (RAC, or Refiner Acquisition Cost). Hawaii crude costs are consistently much higher than the US average cost. Hawaii costs track the US WTI benchmark (Both the WTI crude and Hawaii's typical crude supply tend to be light, sweet crude oil). The overall pattern of crude costs in Hawaii track global crude markets, as indicated by the WTI price and also the RAC price[6].

This chart clearly indicates that Hawaii refiners' crude costs follow global market crude prices.

[6] RAC represents both US domestic crude prices as well as the price of volumes of crude imported from Canada, Mexico, Venezuela, Saudi Arabia, Nigeria and many other sources. It is a weighted average landed US crude cost.

Exhibit 2.6 Hawaii Crude Cost Comparison to RAC and WTI

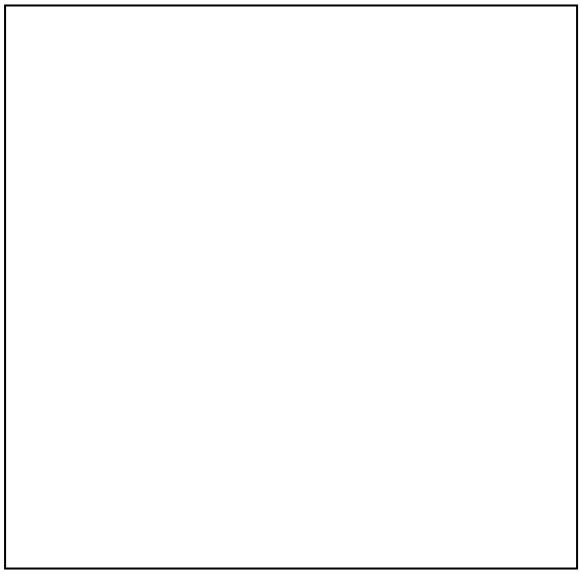


Sources: Hawaii- IPIR and PIMAR; WTI & RAC- EIA

Hawaii average landed crude costs over the study period have averaged as low as [redacted] above the U.S. RAC price and as high as [redacted] above the RAC price. This variation can occur when one of the Hawaii refiners may be purchasing a particular crude cargo that may be lower in quality (and therefore price) than the average light, sweet crude purchased in Hawaii. [redacted] The higher cost paid by Hawaii for crude is based on the fact that Hawaii's refiners must process higher quality crudes, and also that shipping costs for crude into Hawaii can be expensive.

Exhibit 2.7 shows that as global crude prices escalated in 2008, Hawaii's crude prices tended to drop versus WTI and RAC prices. This may be reflecting either 1) Hawaii's dependence on Far East crudes, which may have narrowed in price versus U.S. and Atlantic basin crudes in 2008 or 2) Hawaii refiners' crude processing economics may have driven the purchase of heavier crudes at lower throughputs in 2008.

Exhibit 2.7 Hawaii Landed Crude Cost Comparison to RAC and WTI



Sources: Hawaii- IPIR and PIMAR; WTI & RAC- EIA

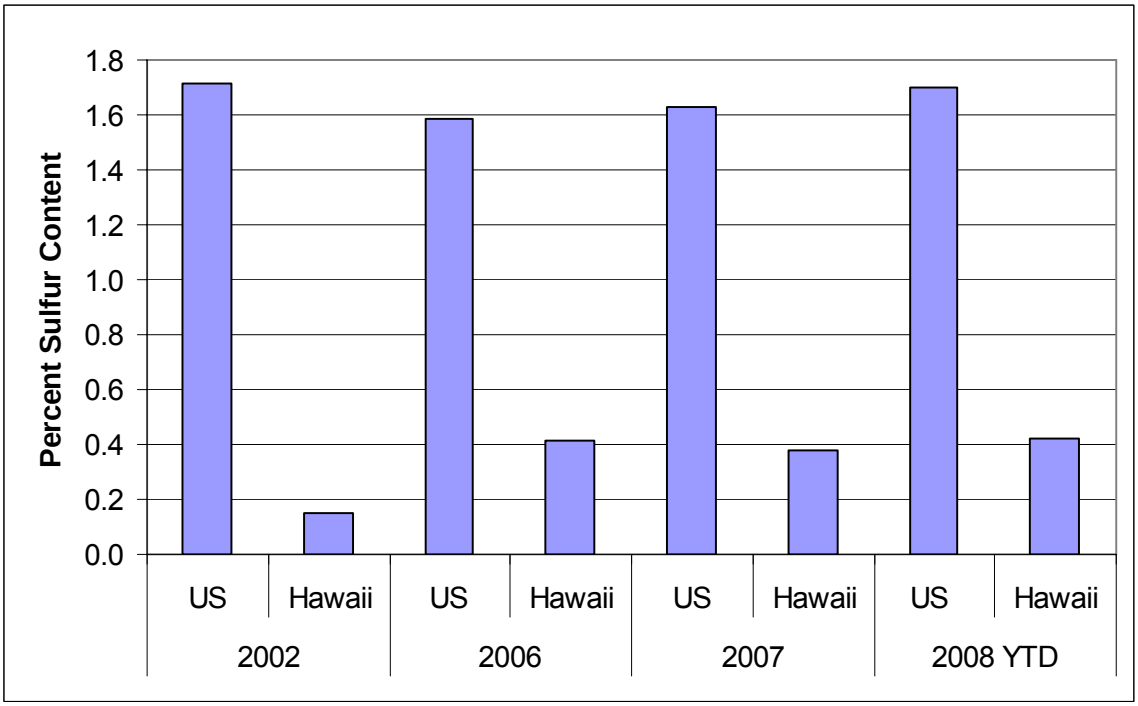
Crude Supply and Sources

The quality and cost of crude purchased by Hawaii refiners is constrained by the configuration and design of the refineries, and the product quality requirements dictated in the marketplace. Hawaii's refineries are older and significantly less capable to process the heavier[7] gravity and higher sulfur content crudes that most U.S. refineries can process. Exhibit 2.8 below shows Hawaii's crude oil sulfur content and Exhibit 2.9 shows Hawaii's API gravity versus the average U.S. crude processed in 2002, 2006, 2007 and 2008 YTD:

The most recent year (2008) is very similar to 2006, however in 2008 the API gravity of Hawaii crude has decreased by about 1 API.

[7] Heavier means a lower API gravity, meaning the density of the crude oil. Heavier crudes are much more difficult to refine into lighter products such as gasolines and distillates.

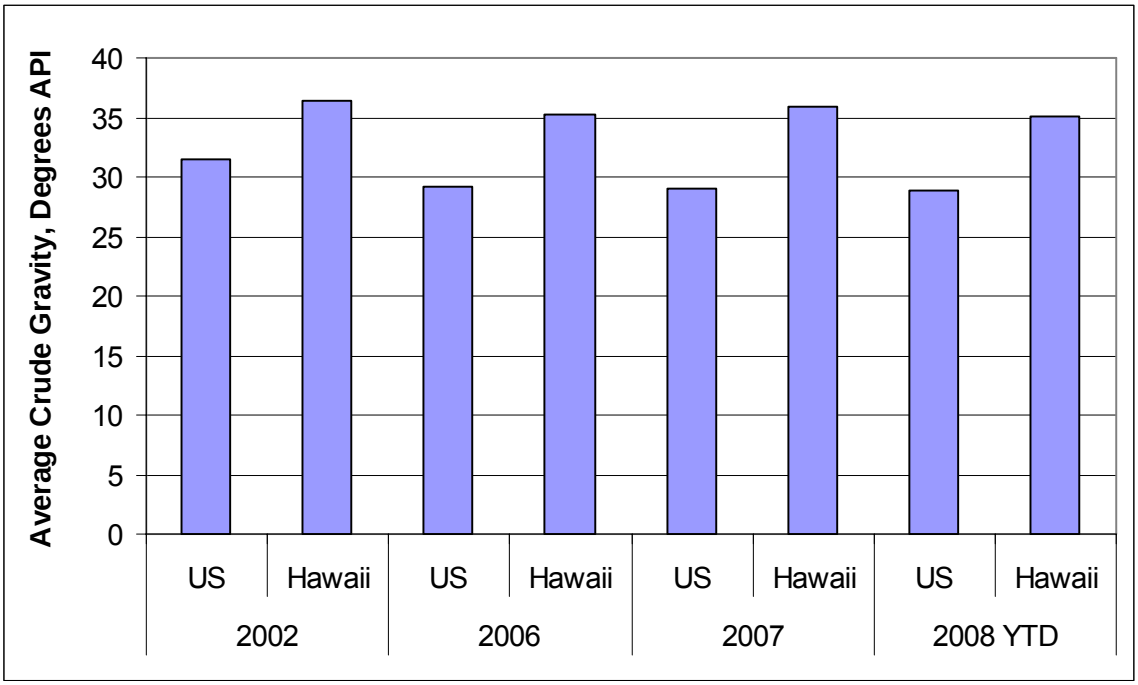
Exhibit 2.8 Hawaii and U.S. Crude Sulfur Content, 2002, 2006, 2007 and 2008 YTD



Source: EIA-814 Imported Crude Data

Similarly, the gravity of the Hawaii crude slate has been over 5 degrees API above the US average. Both sulfur and gravity are key price factors in the cost of crude oil, with higher API being a significant price factor (higher API = higher cost). As long as Hawaii's refineries require these types of crude oils, the cost disadvantages will remain.

Exhibit 2.9 Hawaii and U.S. Crude API Gravity, 2002, 2006, 2007 and 2008 YTD



Source: EIA-814 Imported Crude Data

The two exhibits above indicate that Hawaii's imported crude purchases have a much lower sulfur content than the U.S. average (0.4% sulfur versus the U.S. average of 1.6% sulfur content in 2006). In addition, Hawaii crudes are much lighter in gravity (less dense) than U.S. average crudes, averaging over 35 API gravity versus the U.S. average of about 30 in 2006 and 2007, and slightly lower in 2008.

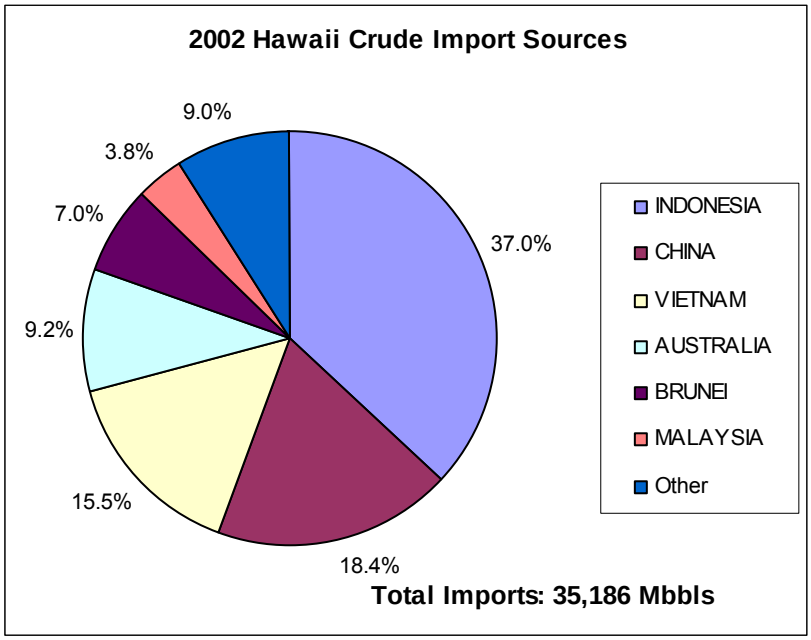
Crudes are valued in commodity markets based on their quality. In most cases, low sulfur crudes are more expensive than higher sulfur crudes, and higher gravity crudes are more expensive than lower gravity crudes. Consequently, it is not surprising that Hawaii refiners have a much higher crude cost than the average U.S. refiner.

The sources of crude oil for Hawaii's refineries have been primarily from foreign countries. Hawaii's crude import sources have changed somewhat from 2002 as seen in Exhibit 2.10 below. The exhibits show a higher level of imported crude in 2006, 2007 and 2008 YTD versus 2002. This is because in 2002 Hawaii refiners also processed some domestic North Slope crude oil (ANS), which has essentially been discontinued in 2006.

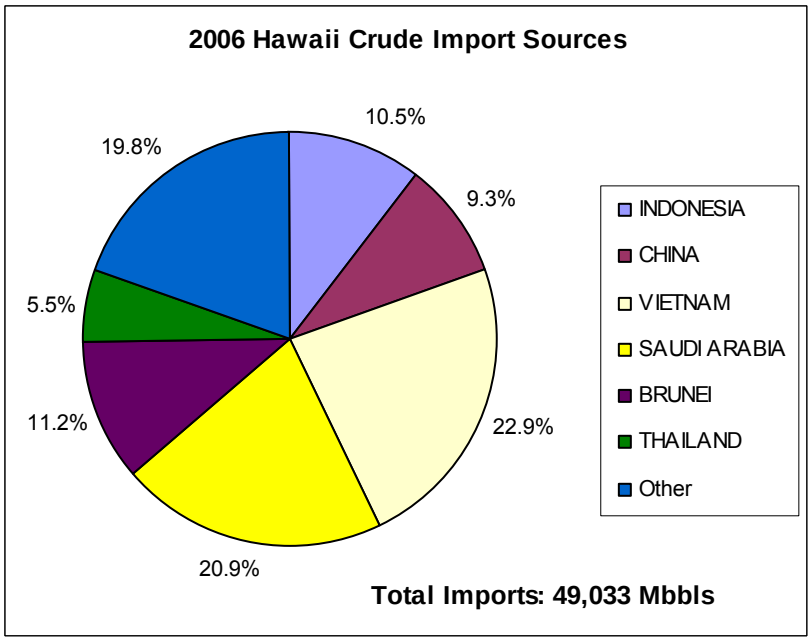
The major changes (other than North Slope) involve an increased reliance on Vietnam and Saudi Arabia for crude, and somewhat less dependence on Indonesia. Trends in 2007 and 2008 show continued reliance on Vietnam and Saudi Arabia for crude supply, but 2008 shows an increase in heavier Chinese crude oil and a reduction in lighter crude from Brunei. Other changes include increased levels of crude from Thailand and an increase from Libya.

Overall Hawaii refiners appear to have kept their main crudes in 2008 (Saudi, Vietnam, Indonesia, etc.) and adjusted their crude mix to process a heavier, lower cost crude slate.

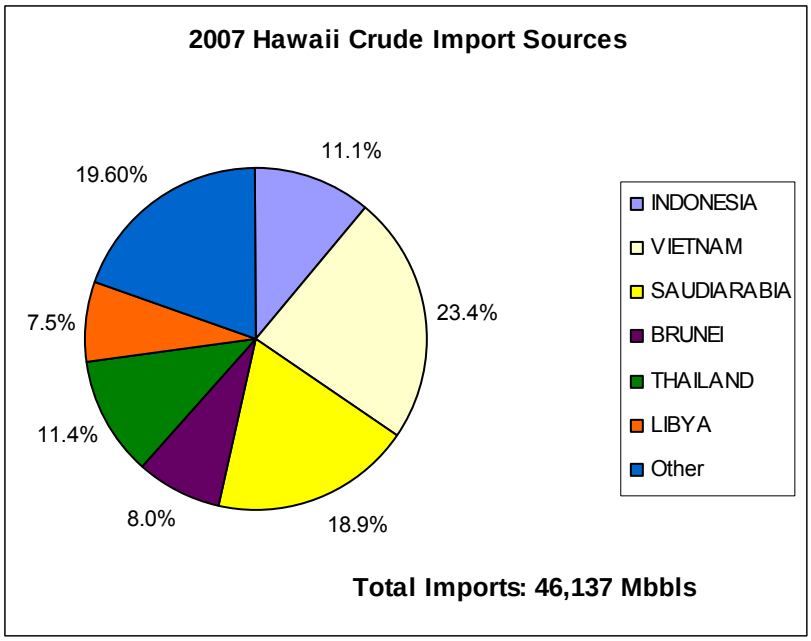
Exhibit 2.10 Hawaii Crude Sources, 2002, 2006, 2007 and 2008 YTD



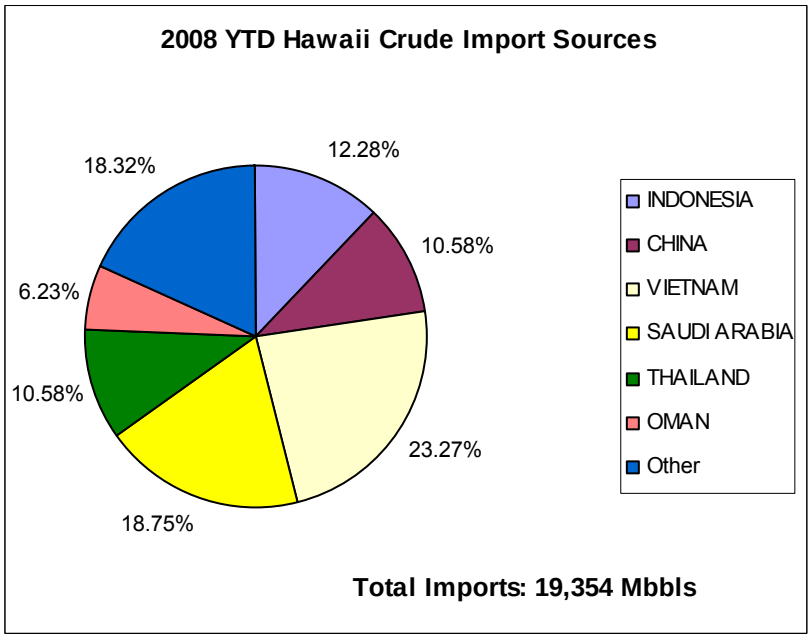
Source: EIA-814 Imported Crude Data



Source: EIA-814 Imported Crude Data



Source: EIA-814 Imported Crude Data



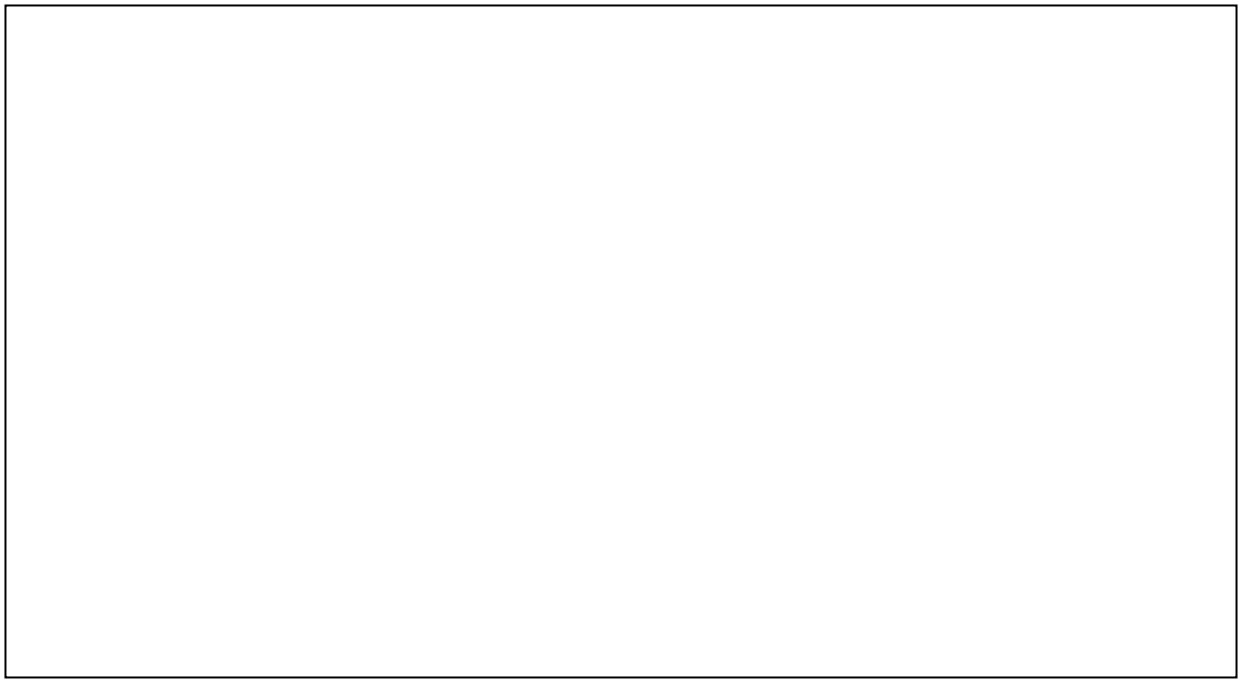
Source: EIA-814 Imported Crude Data

The refinery requirements for sweet and higher gravity crude oils limit purchase options. In 2002, Hawaii refiners were able to procure crude from 41 different countries, plus ANS. In 2006, import records indicate that Hawaii refiners purchased crude from 48 different countries. While the primary crude sources are four or five countries with crude that appears to economically fit each refiner, the fact that a large number of other crudes are procured from time to time indicates that the refiners are actively looking for “spot” crude cargoes that would be economic in the refinery. Pacific Rim countries are the primary sources, although the refiners appear to be able to procure occasional cargoes of crude from other sources.

Freight Costs to Deliver Crude

Hawaii's location and the relatively small size of the Hawaii refineries result in higher freight costs to deliver crude into the state. Freight costs are impacted by world freight markets (the value of tonnage), the size of delivery vessels, and the distance to deliver the products. An analysis of Hawaii's freight costs from source countries supplying crude oil over the study period is outlined below in Exhibit 2.11.

Exhibit 2.11 Crude Oil Freight Costs to Hawaii, September 2005 to June 2008



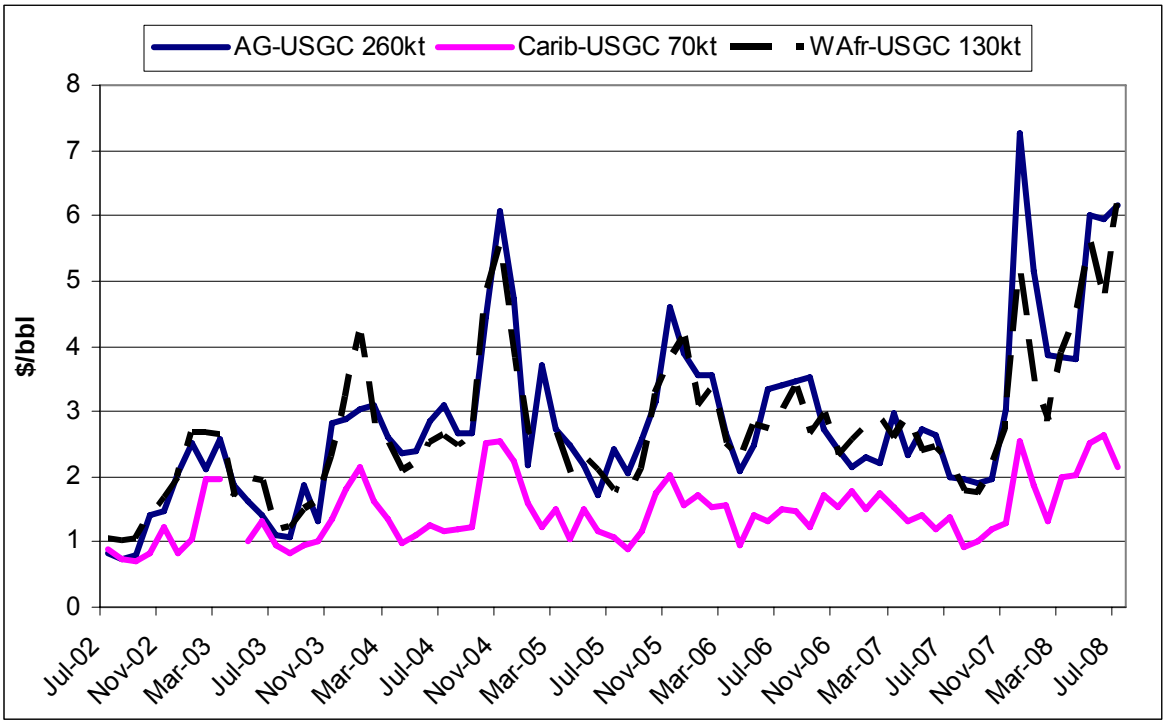
Source: IPIR and PIMAR

The exhibit above shows that, on average, Hawaii's major crude import sources (Saudi Arabia, Vietnam, China, Thailand, Indonesia, Brunei, etc) have tended to average between [redacted] freight cost.

To put this into perspective, Exhibit 2.12 below shows the cost to deliver crude into the U.S. Gulf Coast from major U.S. import sources (Saudi Arabia, West Africa, and Latin America). These freight costs are from Platt's and reflect movement of crude oil into the U.S. Gulf Coast (USGC) from the Arabian Gulf (AG) on VLCC's (Very Large Crude Carriers with 2,000 MB crude), from West Africa (WAFR) on LR-2 size vessels (about 980 MB) and from the Caribbean/Latin America on 500 MB vessels.

This exhibit shows the volatility of freight rates and the impact on crude prices. Freight rates almost doubled in late 2007 and 2008 vs. the prior several years. This affects all destinations, not just Hawaii, but it clearly raised the cost of crude to Hawaii refiners.

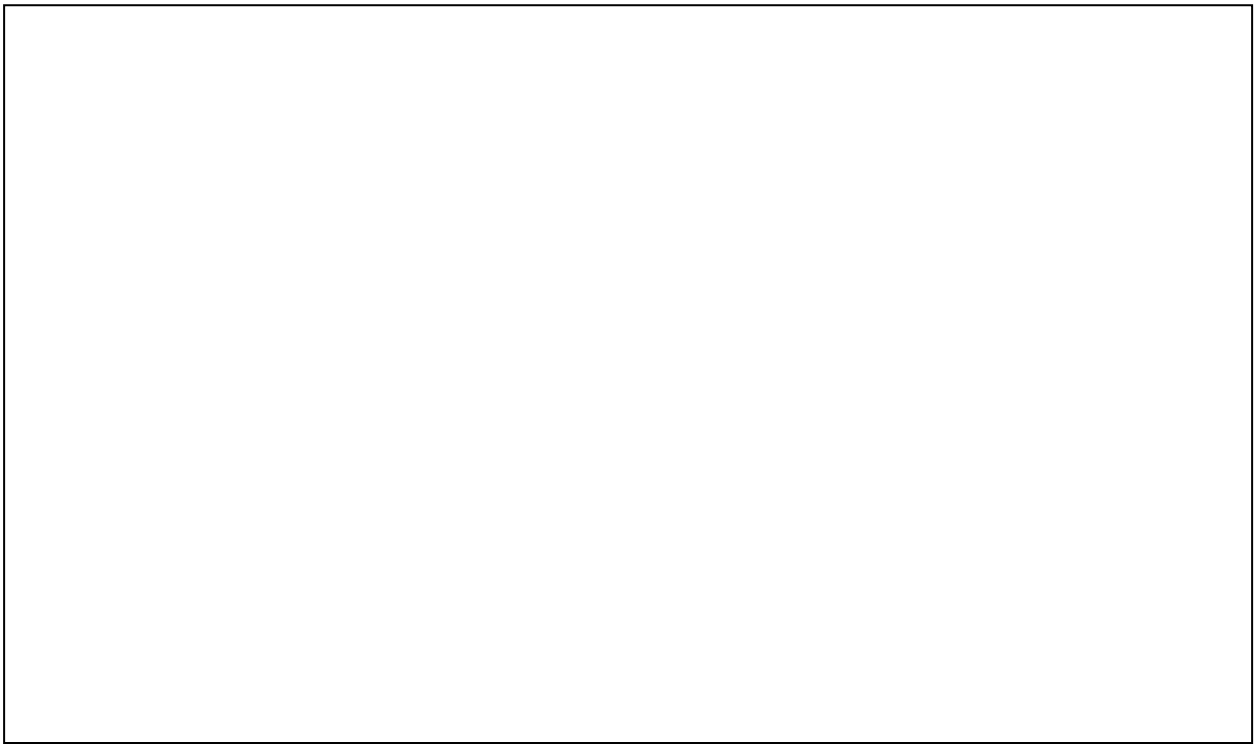
Exhibit 2.12 Crude Freight Market Costs to USGC from Various Sources



Source: Platts

The freight costs indicate that Hawaii's normal crude freight costs of [redacted] shown in Exhibit 2.11 are about a [redacted] higher freight cost than typical crude sources into the Gulf Coast refiners. A comparison of actual crude delivery costs into Hawaii for Saudi Arabia crude versus Saudi supply in the Gulf Coast is shown on Exhibit 2.13 below:

Exhibit 2.13 Hawaii Freight Costs from Saudi Arabia vs. Saudi Costs to USGC



Source: Platts

This exhibit has some data gaps (crude was not delivered each month into Hawaii from Saudi Arabia), however it indicates that in most months there is a sizable premium for freight into Hawaii versus the U.S. Gulf Coast. Although the distance in this case is roughly similar (about 9,500 miles to both Honolulu and Houston from Saudi Arabia), Hawaii deliveries are on smaller vessels and the freight route is not a mainline route for crude cargo vessels, hence the cost per barrel is higher.

Crude Summary

Data submitted by the Parties importing crude, as well as analysis of import records indicate that Hawaii's refiners are required to pay a significant premium for crude oil compared to the average U.S. refiner, ranging from [redacted] above the U.S. average crude cost into refineries. Most of the higher cost appears to stem from the need to purchase more expensive crude than mainland refiners due to the Hawaii refineries' need for lighter and sweeter crude. Freight costs comprise about [redacted] of that total penalty.

The higher raw material cost is a major impediment to Hawaii refineries' ability to earn a similar return on investment to mainland refiners. In the 2003 Stillwater study[8], it was estimated that in 2002 the Hawaii refinery crude costs averaged $3/barrel above the cost incurred by California refiners. The data reviewed in this study indicates that Hawaii crudes are averaging [redacted] above the U.S. average crude cost**.** This is a far greater penalty than in 2002 and

[8] Study of Fuel Prices and Legislative Initiatives for the State of Hawaii, August 5, 2003, pages 38 and 39

has worsened since then due to higher global demand for sweeter crude to help refineries meet lower product sulfur specifications.

Refinery Operational Analysis

Refinery crude runs and utilization over the study period

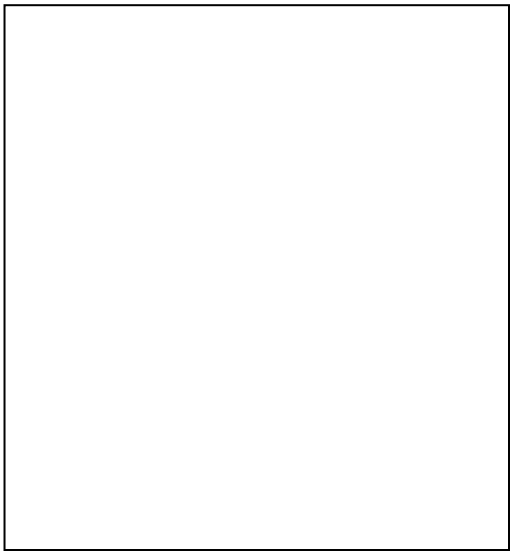
Hawaii's refineries averaged relatively high crude runs over the study period until the fourth quarter of 2007. The exhibits indicate periods of higher or lower crude rates during various periods. These variations, which are not explained by comments in data submissions in either the IPIR or PIMAR reports, typically reflect periods of required maintenance (planned or unplanned) for one or more of the refinery process units. The variation may also reflect different crudes being processed in any given period.

Beginning in the fourth quarter of 2007, the average runs for both refiners declined, with Chevron dropping to [redacted] and Tesoro to [redacted] over the period through June 2008. The reasons for this decline are 1) Operational problems at Tesoro in the fall of 2007 which required reduced crude throughputs to manage inventory and 2) Lower runs due to weak refining margins[9].

The lower production levels required more importing of jet fuel in 2008 to sustain supply, however reductions in gasoline demand and higher yields of residual fuel kept overall supply and demand balanced.

[9] Reduced runs due to weak margins were specifically announced by Tesoro and other refiners on the West Coast during this period.

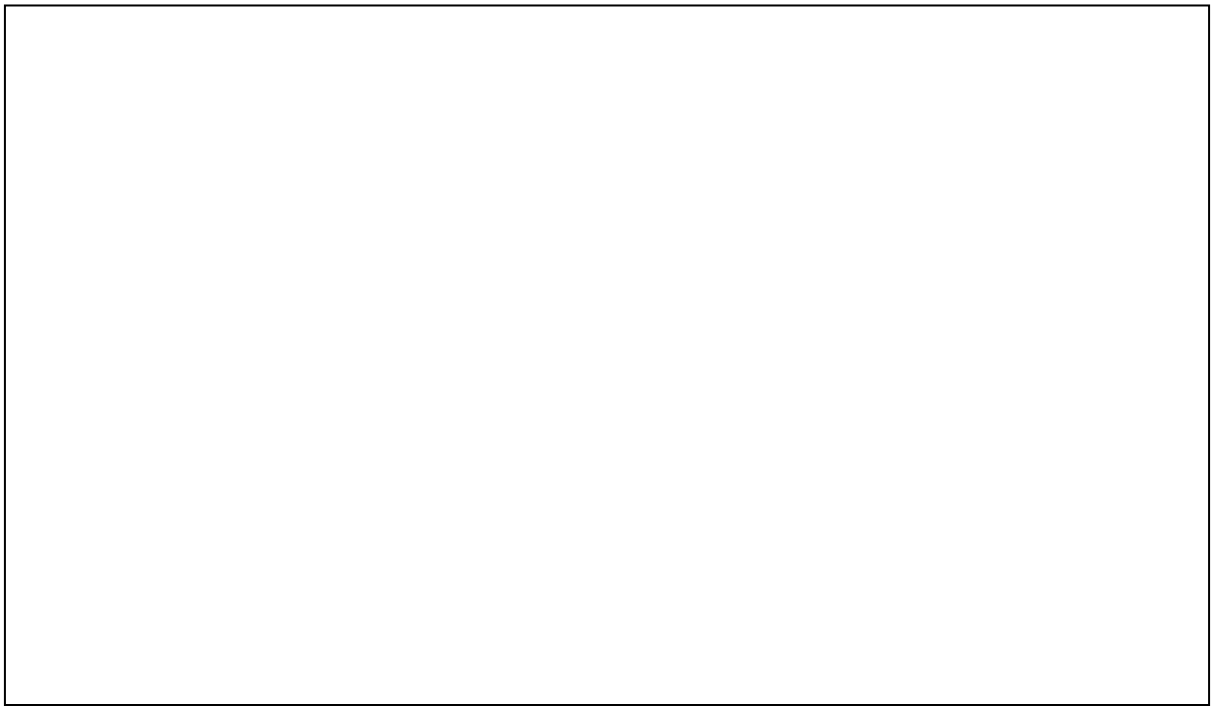
Exhibit 2.14 Hawaii Refinery Crude Runs by Quarter, 2005–2008



Source: IPIR and PIMAR

[redacted] The variations are somewhat typical of most refineries, as different crude quality characteristics can impact day to day throughput. The movement to lower runs in late 2007 is very evident.

Exhibit 2.15 Daily Crude Processing Trend: Hawaii Refineries

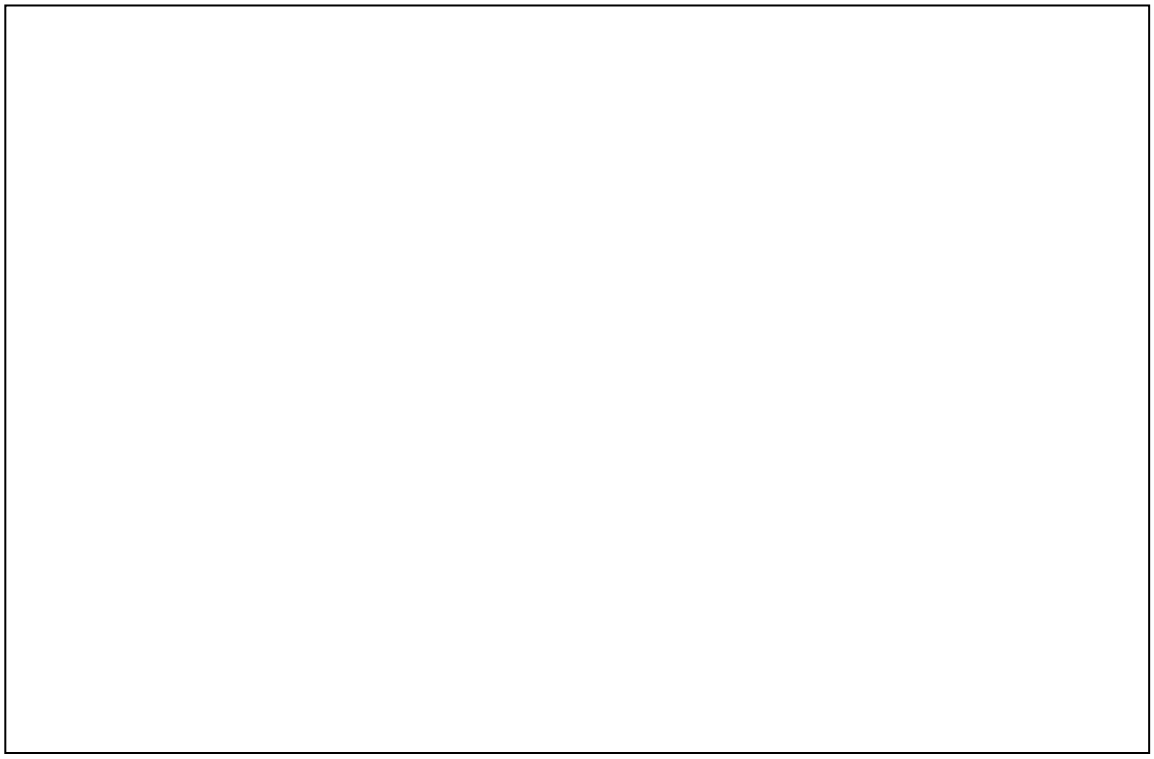


Source: IPIR and PIMAR

Exhibit 2.16 below shows the Hawaii refinery utilization over the period[10]. Refinery Utilization averaged about [redacted] over the study period. This compares to the U.S. refinery average of 87.8% over the same time frame. Hawaii utilizations have declined to [redacted] in 4Q 2007 to [redacted] in 2Q 2008 reflecting low refining margins and Tesoro operational issues.

[10] Refinery utilization is a measure of the crude processed in a refinery versus the crude capacity

Exhibit 2.16 Utilization Trend: Hawaii Refineries



Source: IPIR and PIMAR

Refinery Yields of Key Products

The yields of key products from each refinery were tracked over the study period, as shown in the exhibits below. Comments on each of the exhibits are noted.

Gasoline

Exhibit 2.17 shows the pattern of gasoline production from both refiners. [redacted] Data is erratic from week to week as (presumably) refinery gasoline blending into finished product or blendstock was not ratable[11]. Gasoline yields are tracked only through March of 2006. After March, IPIR reports did not show gasoline production since the refiners had converted to HIBOB production for ethanol blending. Over this period (during gas caps), refiner gasoline production was relatively stable, except for one brief period in early December for an apparent refinery operational problem.

In some cases there were weekly periods when no data was reported at all. These are shown as breaks on the exhibit. With the initiation of PIMAR reports in 2007, gasoline production was

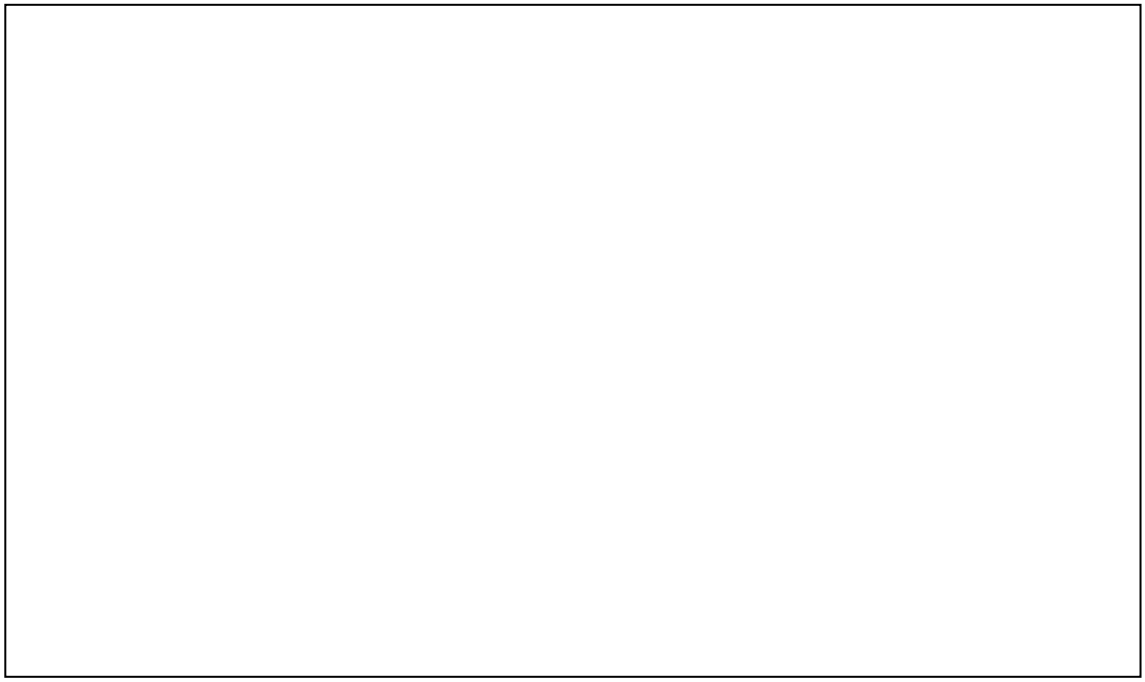
[11] IPIR forms allow for an explanation of operational issues that affect weekly data, but these were not provided by the refiners

again available to be included on the exhibit. Note that volumes reported in 2007 are for HIBOB product[12].

[redacted]

[redacted]

Exhibit 2.17 Gasoline Production Trend



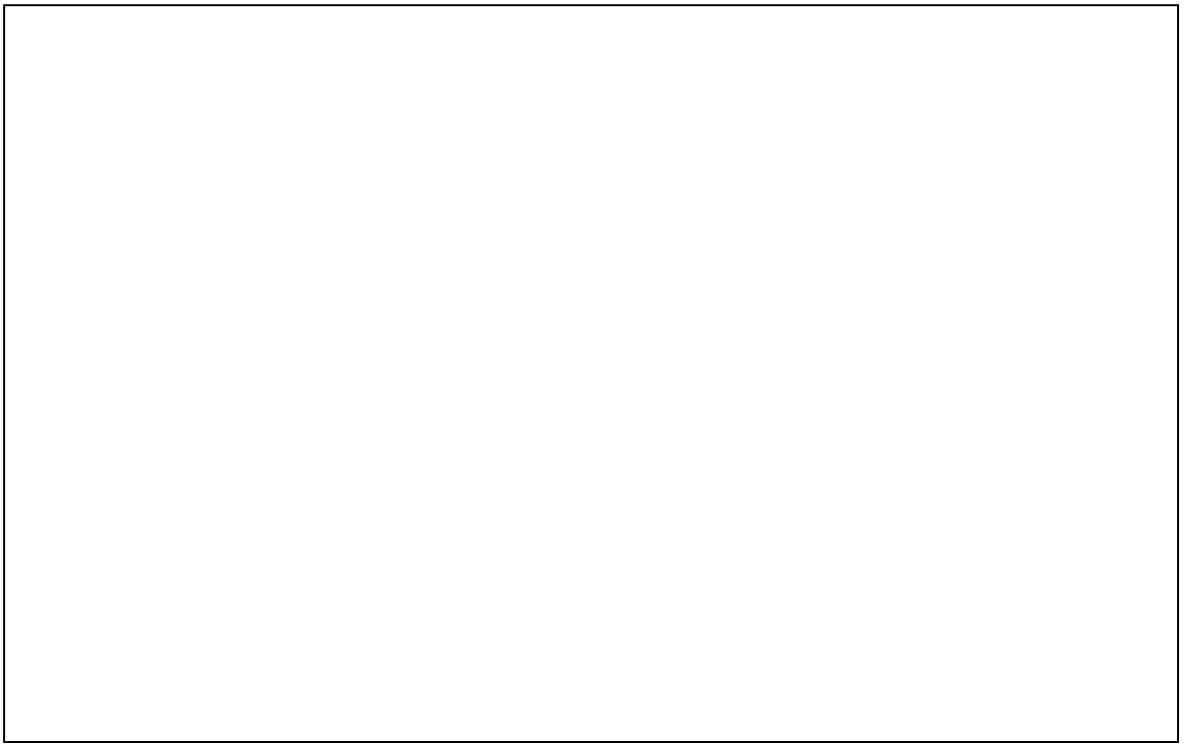
Source: IPIR and PIMAR

[12] Hawaii Blendstock for Oxygenate Blending (HIBOB). This is now the primary refinery gasoline being shipped for ethanol blending at the terminals.

Exhibit 2.18 below shows the trend in Jet Fuel production at the refineries. Jet fuel is the largest single volume of product produced in Hawaii. [redacted]

Exhibit 2.18 Jet Fuel Production Trend

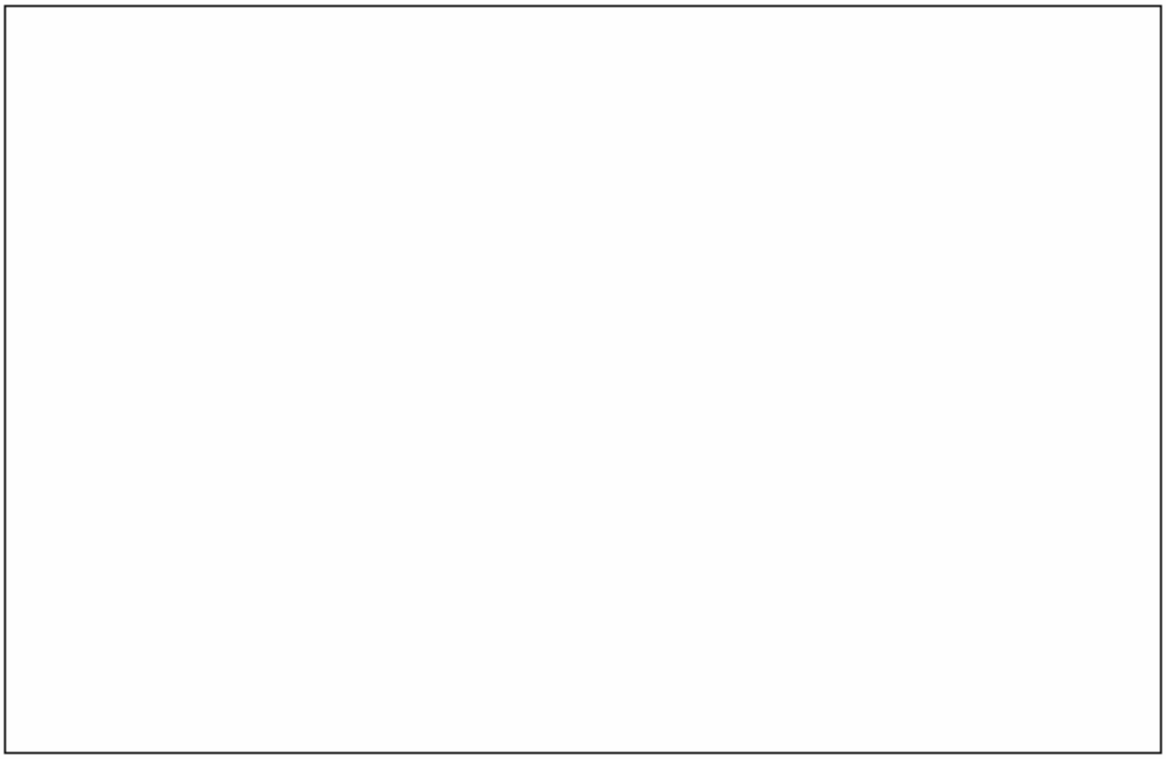
Source: IPIR and PIMAR



Diesel fuel refinery yields are presented in Exhibit 2.19 as combined ultra low sulfur diesel (under 15 ppm sulfur), low sulfur diesel (15-500ppm sulfur) and higher sulfur (over 500 ppm sulfur). The overall diesel production is relatively stable over the period; however the week to week variability is high due to the timing of diesel production batches. [redacted]

[redacted]

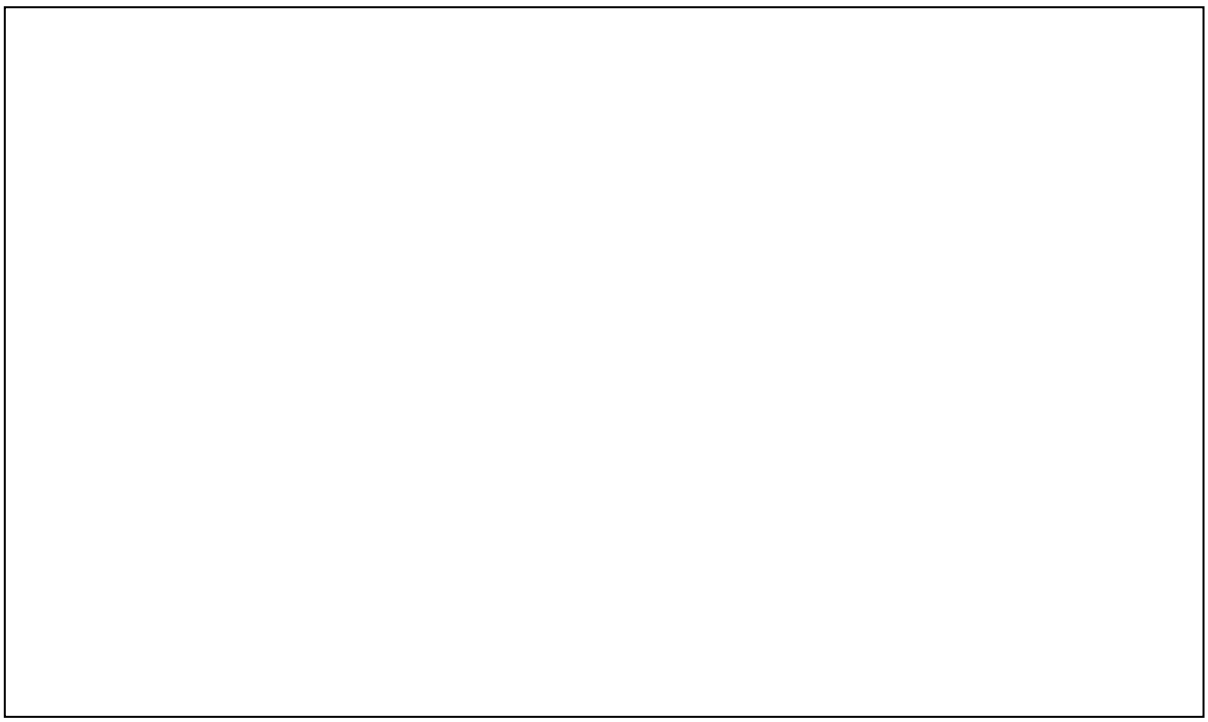
Exhibit 2.19 Diesel Fuel Production Trend, All Grades



Source: IPIR and PIMAR

[redacted]

Exhibit 2.20 Diesel Fuel Production Trend by Grade



Source: PIMAR

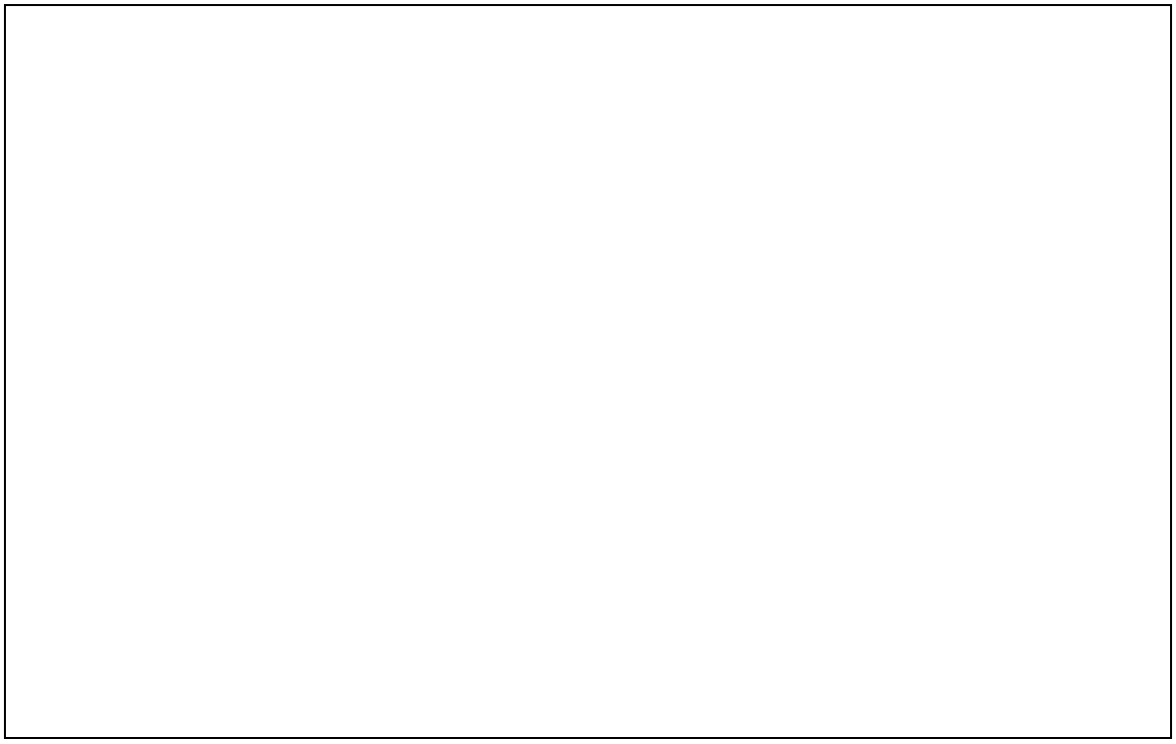
Residual fuel production numbers are shown in Exhibit 2.21 and are being reported as combined for both under 1% sulfur and over 1% sulfur. Residual fuel production numbers can vary more significantly based on the specific type of crude oil being processed, and the need to batch blend residual fuel with other stocks to meet viscosity requirements of the residual fuel[13]. Some crudes can have over 30% residual fuel yield and others under 5%. Most refinery residual yield must be blended with lighter stocks to "cut" the residual fuel viscosity so that it can be shipped and used in burners. Consequently, some refiners produce residual fuel ratably and others have more of a batch approach to blending the finished residual fuel.

[13] Viscosity is the characteristic that measures the ability of heavy fuels to flow, be pumped, etc.

Residual fuel production and yield in Hawaii refineries is much higher than almost all other U.S. refineries. There is a strong demand for residual fuel in Hawaii for both power generation and ship bunkering, so the refiners are configured to meet those demand needs. However, the value of residual fuel in commodity markets is far lower than gasoline and distillate product. This, as with the very high crude cost, is a significant penalty to Hawaii refinery margins versus mainland refiners.

The residual fuel chart shows relatively consistent yield over the entire period, [redacted]
This means Tesoro's operational problems either also affected their yields, or that they are processing higher residual fuel-yielding crudes. Higher resid yield on the same type of crude oil would mean significantly lower refinery margins.

Exhibit 2.21 Residual Fuel Production Trend



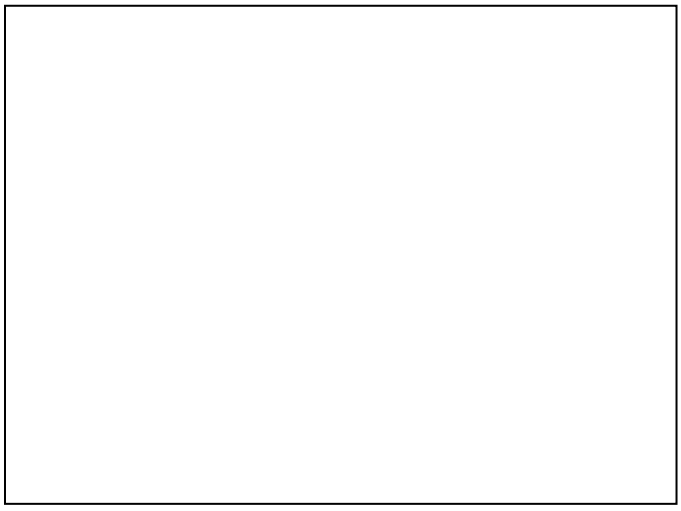
Source: IPIR and PIMAR

Summary

The table below (Exhibit 2.22) shows total Hawaii production of gasoline, jet, diesel and residual fuel by quarter over the study period. It is apparent that jet fuel and residual fuel production are [redacted] and are therefore very key factors in refinery economic performance.

Lower overall yields of gasoline, diesel and jet fuel in late 2007/2008 with stable resid production are indicative of poorer refinery margins at constant crude types. It could also indicate that the refiners are processing heavier crudes with higher residual fuel yields.

Exhibit 2.22 Hawaii Refinery Production by Quarter over the Study Period



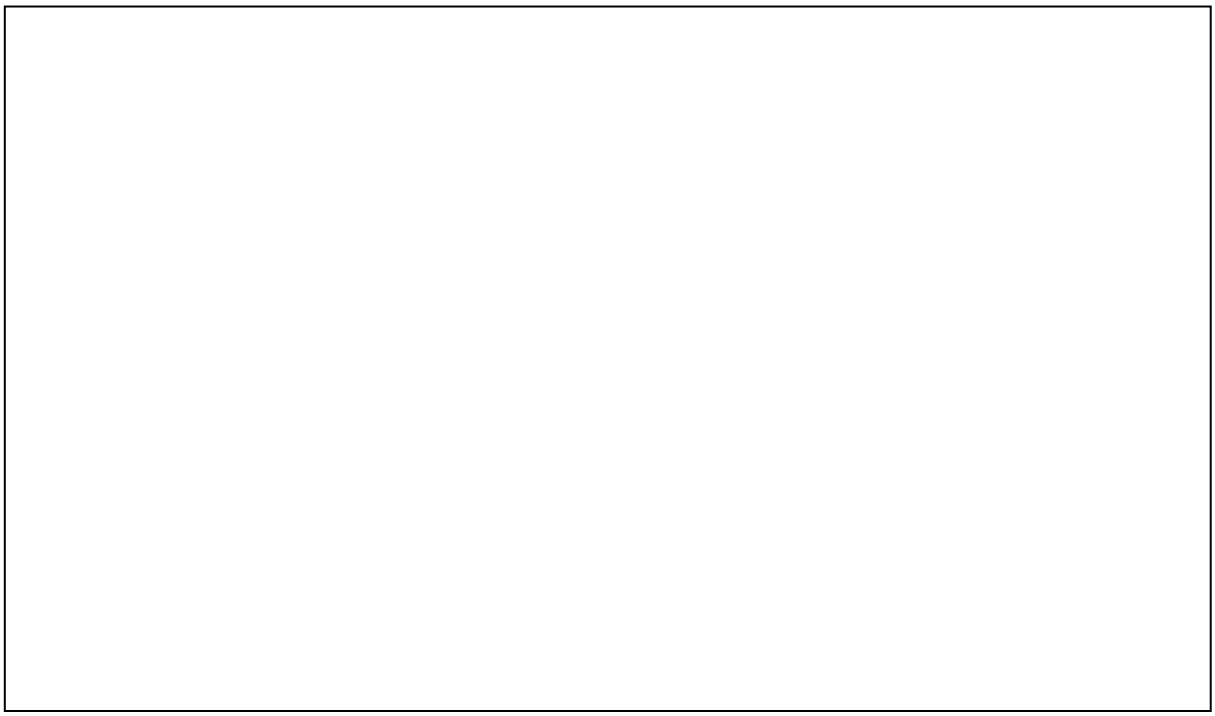
Source: IPIR and PIMAR

Hawaii yields compared to the US average

Hawaii's refineries are configured significantly different than almost all other U.S. refineries. The refineries have been built and designed to align with the product demands in the Hawaii market. Hence they are structured to maximize jet fuel production (due to high jet demands), and residual fuel yield to supply required fuel for power generation and ship bunkering. This means that the degree of process equipment (cost and technology) required is less than many other U.S. refineries. The Hawaii refineries also do not have the metallurgy or sulfur handling facilities to tolerate higher sulfur crude oils, as noted earlier.

Hawaii's key product yields are shown below (Exhibit 2.23) versus the US average[14].

Exhibit 2.23 Hawaii Yield Comparison to U.S. Average Refineries



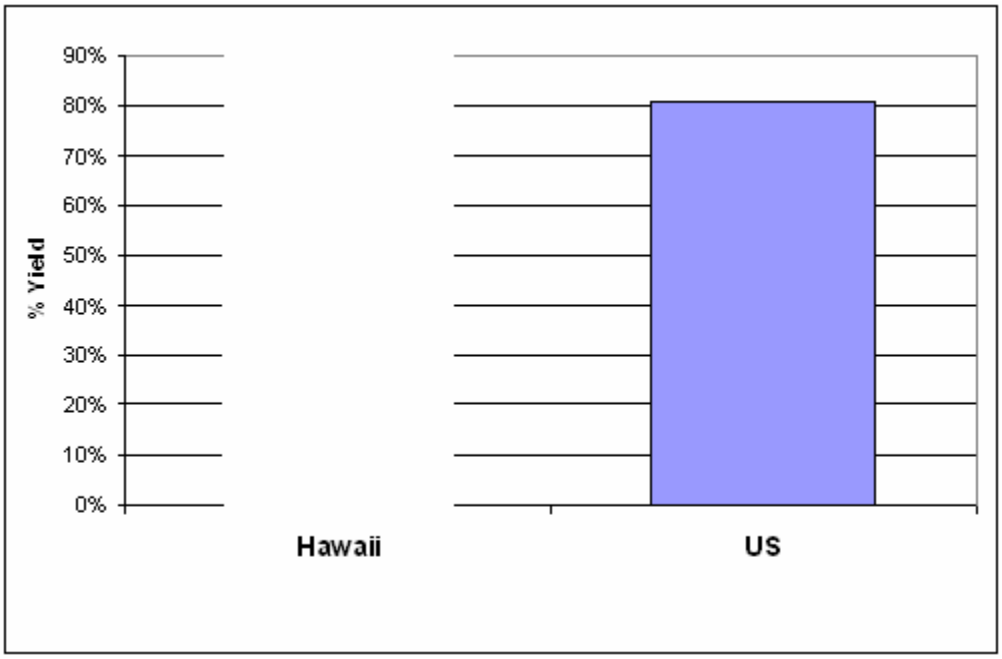
Sources: Hawaii- IPIR and PIMAR; US- EIA

[14] Hawaii yield is TBD of product production divided by TBD crude input. The EIA data is calculated in the same manner per EIA definition.

U.S. refinery gasoline yields average [redacted] Hawaii's gasoline yields, primarily due to more sophisticated refinery process units in typical U.S. refineries. The higher degree of sophistication also is reflected in the much lower residual fuel yield in U.S. refineries (about 4%) versus Hawaii's yield of about [redacted] The higher jet yield reflects specific process design to maximize jet fuel yields to meet Hawaii's high demand for jet fuel. [redacted]

Total yield of "clean" products (gasoline, diesel and jet fuel) in Hawaii refineries averages about [redacted] versus the U.S. average of over 80% (see Exhibit 2.24). This is an important factor in refinery gross margin, since clean products' market prices are typically well above crude (raw material) costs, and residual fuel prices are well below crude costs. For example, Hawaii refinery's [redacted] lower clean product yield (and higher residual fuel yield) would mean a lower refinery gross margin of [redacted] based on an estimated spread of [redacted] between clean and residual products.

Exhibit 2.24 Hawaii Clean Product Yield vs. U.S. Average



Sources: Hawaii- IPIR and PIMAR; US- EIA

Key Product Supply and Demand Balances

The supply chain for products in Hawaii involves several sources of supply, an infrastructure with inventory (terminals) as well as several outlets for demand. Briefly, these include:

Supply:

Refineries: Obviously the Chevron and Tesoro refineries produce the bulk of all petroleum fuel for Hawaii.

Imports: Product is imported into Hawaii from both domestic and foreign sources. Imports include both finished products (primarily jet fuel) and blendstocks or feedstocks (for example ethanol).

Inventory: Stocks in inventory can be a source of supply (if inventory is pulled down) or demand (if inventory is built).

Demand:

Fuel Consumed: Petroleum products used by consumers and businesses in Hawaii are the largest portion of demands in the state. These are typically for uses such as transportation fuels, residential use, commercial use, and industrial and utility usage. The PIMAR system measures the demand volumes based on reported sales levels to retail/end use consumers as well as fuel consumed by the petroleum suppliers (refinery fuel consumption, for example).

Exports: Products are exported from Hawaii for a number of reasons. In general, the exports (as will be discussed in the Import and Export analysis) are unfinished products which require additional refining processing beyond the capacity of Hawaii's refineries to handle. There are also some periodic exports of gasoline or diesel fuel.

This initial assembly of Hawaii supply and demand by product using the PIMAR data uncovered several possible reporting enhancements which should be considered. In particular, determination of actual jet fuel demand was masked by the lack of full sales data at Honolulu airport, and diesel fuel sales to utilities appeared to be absent from the PIMAR collection process. These and other data issues will be resolved.

For this table, Production numbers are from the W-140 forms, imports and exports from the W-110 and W-111 Reports (with imports adjusted in the jet fuel category to be consistent with volumes reported to EIA) and inventory changes from the W-120/W-140 forms.

The net supply from this analysis is shown below. ICF feels very comfortable with this "build-up" of Hawaii supply numbers.

Ideally, the demand numbers as determined from the W-130 Retail and End User sales should equal this number. For gasoline and residual fuel the volumes are close. Jet and diesel fuel have possible reporting issues which will be resolved.

The supply/demand table does show interesting information:

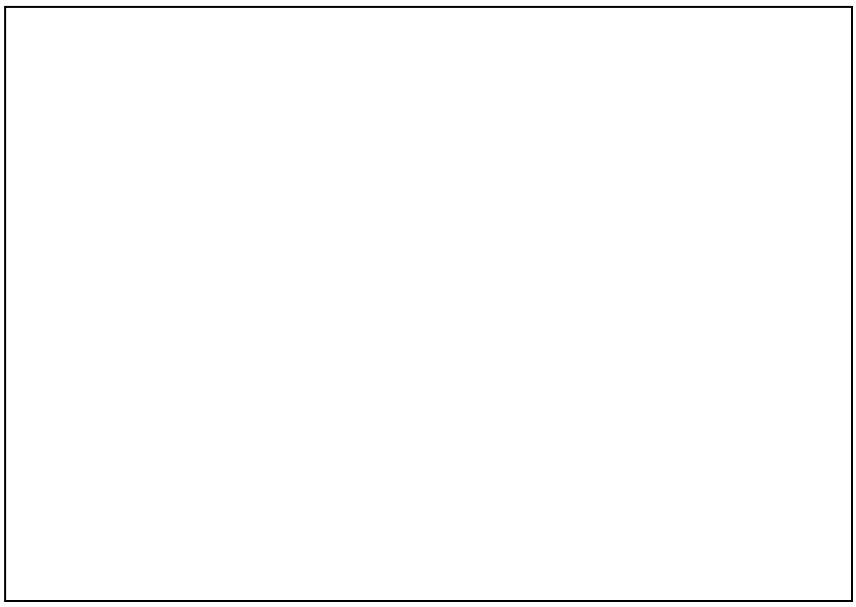
Gasoline: The gasoline balance shows that gasoline supply derives primarily from refinery production and ethanol imports. There are minimal additional imports of gasoline over the period. To balance supply, almost [redacted] of exports were required (to control inventory). These exports primarily occurred in 2007, and included both finished gasoline and low octane gasoline blendstocks (which refiners in Hawaii were not able to convert to finished gasoline). Import analysis (later in Section 2) shows that the need to export declined significantly in 2008 after refineries reduced crude runs.

Diesel: The diesel balance shows much lower volumes of production than gasoline. Import and export levels are small relative to production, and were primarily due to the need to import ULSD fuel and export higher sulfur grades to manage inventory.

Jet Fuel: Jet fuel demands in Hawaii are very high compared to any other fuel. Refinery production must be supplemented by a large volume of jet fuel imports to meet demands. In 2007 and 2008 with Tesoro operational problems and lower crude runs in 2008 by both refiners, jet imports were about [redacted] of refinery supply.

Residual Fuel: Hawaii refineries produce more residual fuel than any other product. Imports are not required to meet demands, which are primarily for utilities in Zone 1 and ship bunkering.

Exhibit 2.25 Hawaii Supply and Demand Balances, 2007–2008 YTD



Source: PIMAR

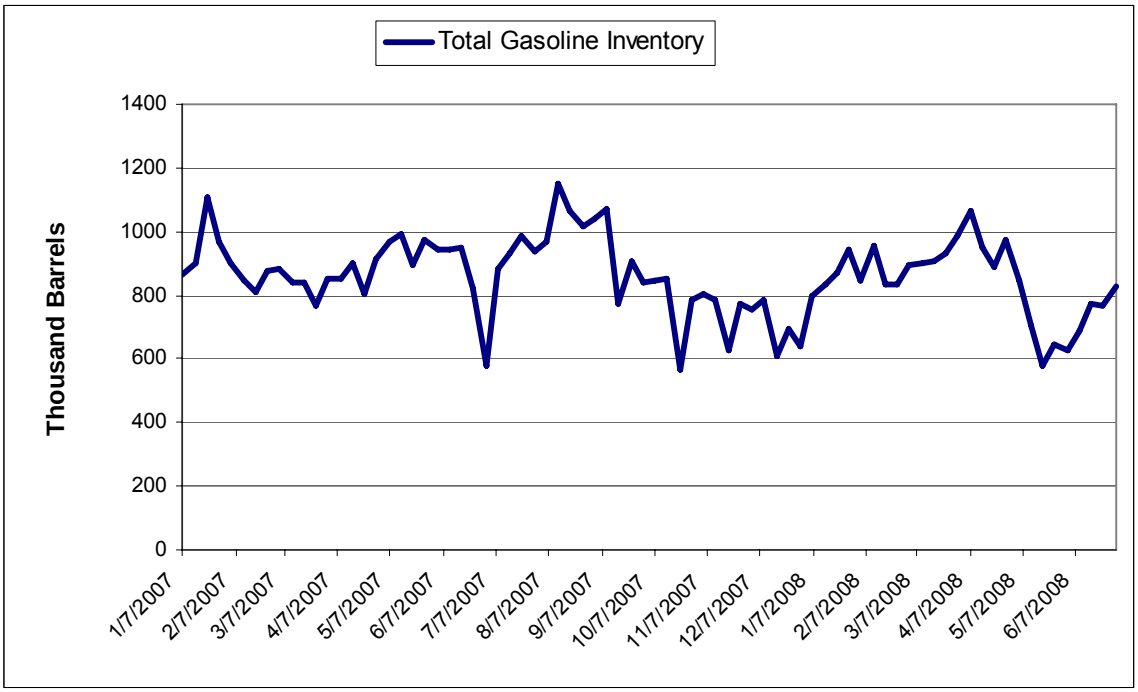
Key Product Inventory Analysis

The use of the PIMAR database provides the opportunity to present charts of Hawaii's inventory levels of key products. The inventory presented includes data reported on the W-120 forms as well as the W-140 forms. The W-120 forms report inventory levels in terminals in Hawaii. The W-140 forms report inventory stocks in the refinery, which are clearly part of Hawaii's supply. Products included in the inventory include finished products as well as blendstocks. Inventory levels in pipelines, barges, etc are not included in these numbers. The volumes in those transportation sectors are generally static, since pipelines are always full and barges, on average, are either in transit loaded or empty.

The charts with accompanying commentary are presented below.

Gasoline inventory trend is shown on Exhibit 2.26. The inventory has ranged from 600 thousand barrels (600 MB) to 1100 MB, or roughly 20-37 days supply of gasoline at about 30,000 barrels per day consumption. These volumes do not include ethanol, which is shown in a separate chart.

Exhibit 2.26 Hawaii Gasoline Inventory Trend

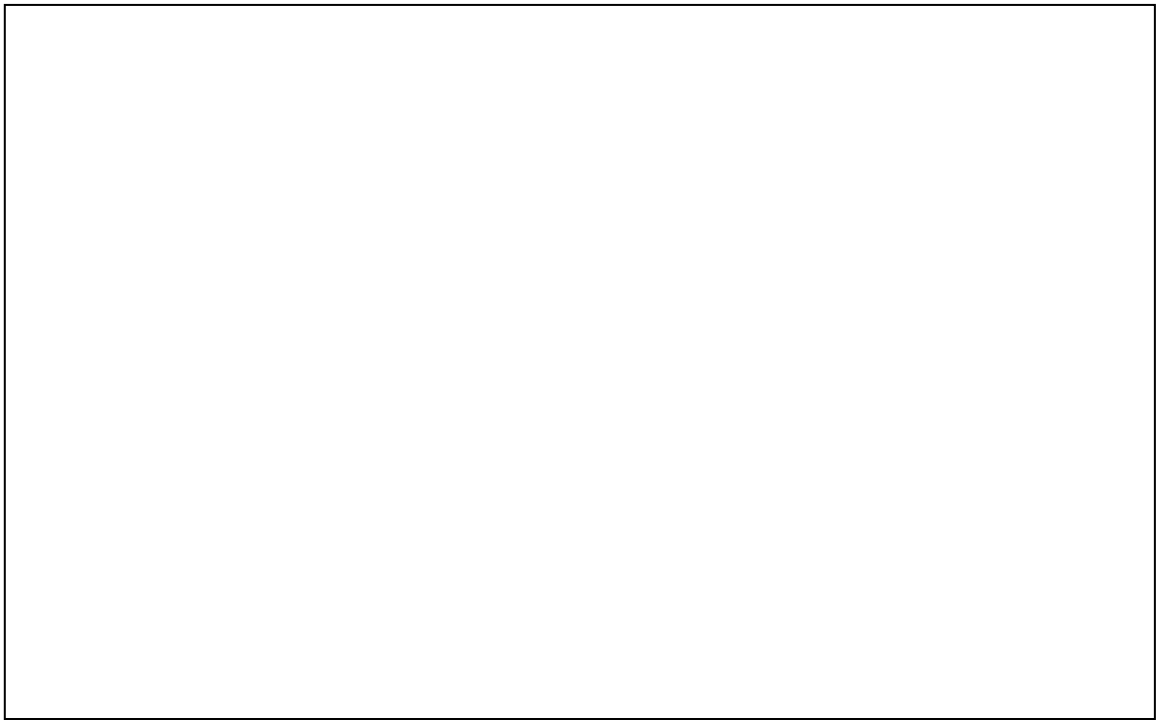


Source: PIMAR

Exhibit 2.27 shows the trend in jet fuel inventory in Hawaii. Jet inventory is primarily concentrated at the refineries and the Hawaiian Fuel Facilities Corporation (HFFC) at Honolulu airport. Jet inventory is typically between [redacted] The large decline in inventories in late 2007 is most likely due to operational issues at Tesoro's refinery [redacted] Lower inventory in 2008 may stem from efforts to reduce inventory carrying costs with high petroleum prices and possibly lower jet fuel demands.

Jet supply is very dependent upon relatively ratable deliveries of imported jet fuel cargoes, which is the source of the multiple spikes in inventory seen on the chart.

Exhibit 2.27 Jet Fuel Inventory Trend

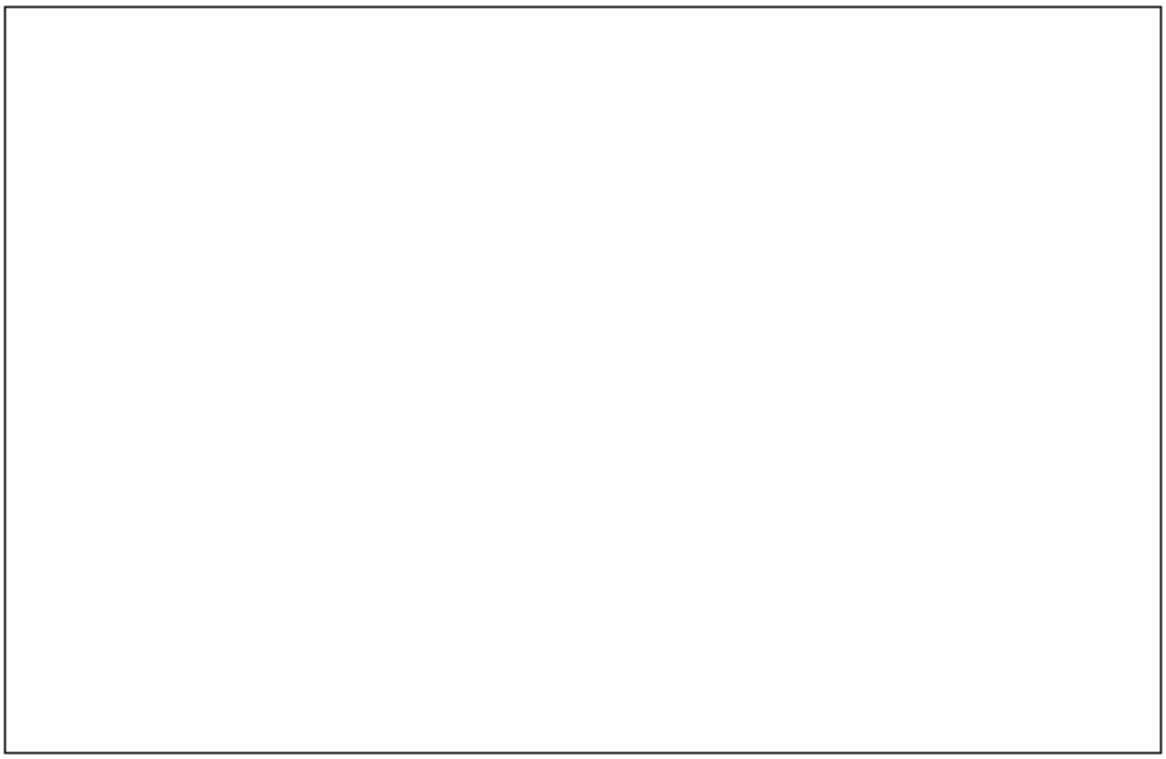


Source: PIMAR

Notes: 8/5/07 data is average of 7/29/07 and 8/12/07;
4/6/08 data is average of 3/30/08 and 4/13/08;
No HFFC reporting before 7/1/07, average of HFFC inventory from 7/1/07 through 6/29/08 was added to each week ending 1/7/07 through 6/24/07

Exhibit 2.28 shows diesel fuel inventory trends over the period. Diesel inventory clearly shows lower levels of 500 ppm sulfur diesel due to changes in quality requirements for off road diesel in 2007. Overall diesel inventories are about [redacted] These inventory levels are lower than gasoline and jet fuel due to lower demand levels for diesel fuel.

Exhibit 2.28 Diesel Fuel Inventory Trend



Source: PIMAR

Notes: Data for Diesel 15-500 was interchanged with data for Diesel 500 on 3/9/08;
10/21/07 data for Diesel 500 is average of 10/14/07 and 10/28/07

Exhibit 2.29 shows the inventory trend for both grades of residual fuel. Inventory in total has averaged between [redacted] over the period. Demand for residual fuel is very high from utilities and ship bunkering operations in Hawaii.

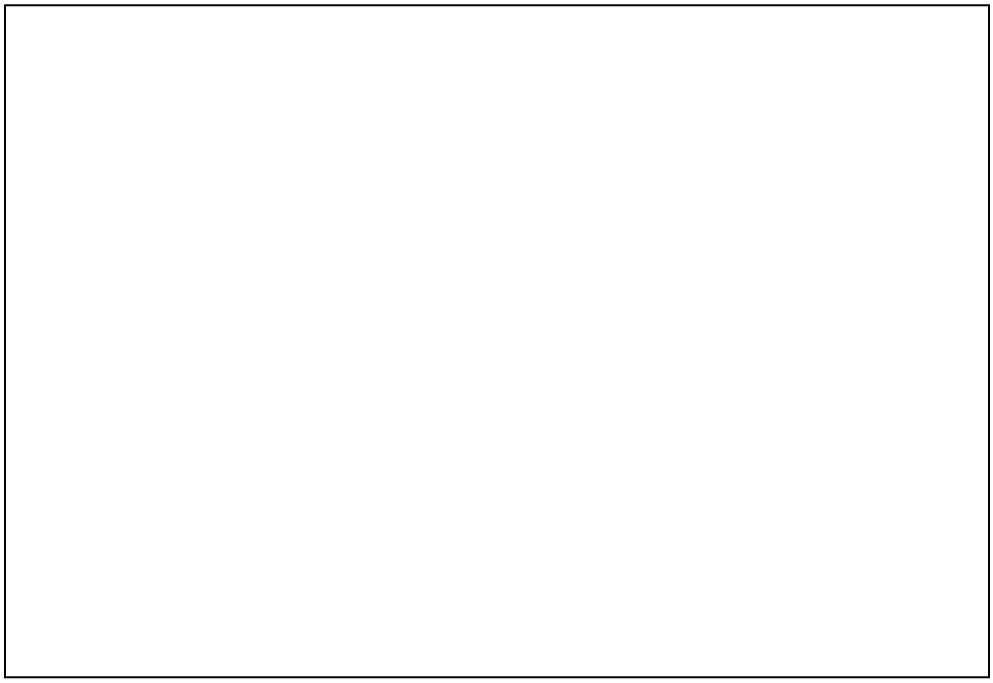
Exhibit 2.29 Residual Fuel Oil Inventory Trend

Source: PIMAR

Exhibit 2.30 shows the trend for ethanol inventory in Hawaii. This chart includes only “neat” (unblended) ethanol in tanks. This chart looks a bit different than others since the overall ethanol inventory is low (roughly [redacted]) and the supply (unlike the other products) comes 100% from imported ethanol cargoes. Each spike “up” represents a cargo delivery, which builds inventory which is gradually drawn down until the next cargo arrives.

With ethanol consumption at about [redacted] (thousand barrels per day) in gasoline, the “low” points in the inventory profile in the chart appear to provide 2 to 3 weeks available supply at minimum points. Barring unusual delays in replenishment arrival, these contingency inventory levels are adequate.

Exhibit 2.30 Ethanol Inventory Trend



Source: PIMAR

Import and Export Analysis

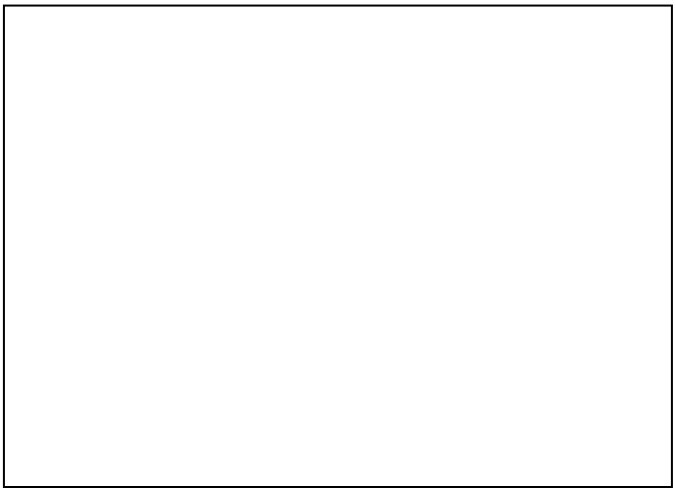
This section will focus on the flow of product (non-crude) imports and exports into and out of the Hawaii market over the study period. The intent is to show how the oil industry is balancing demand needs against refinery capability to meet Hawaii fuel requirements, and/or to balance their system as efficiently as possible.

Overview

The data used for this analysis includes information from the IPIR import and export report forms, supplemented by U.S. EIA import data. In a number of cases imported deliveries occurred from parties who were not required to complete the IPIR forms (for example HFFC). To the degree imports were from foreign sources and captured by EIA's reporting process, those volumes are reflected. Exhibit 2.31 below identifies the overall volume of fuel products imported and exported from Hawaii by quarter from October 2005.

The table indicates that on average, imports of finished products and other products (unfinished oils which require additional processing) average about [redacted] with virtually all the volume being finished product.

Exhibit 2.31 Import and Export Summary over Study Period



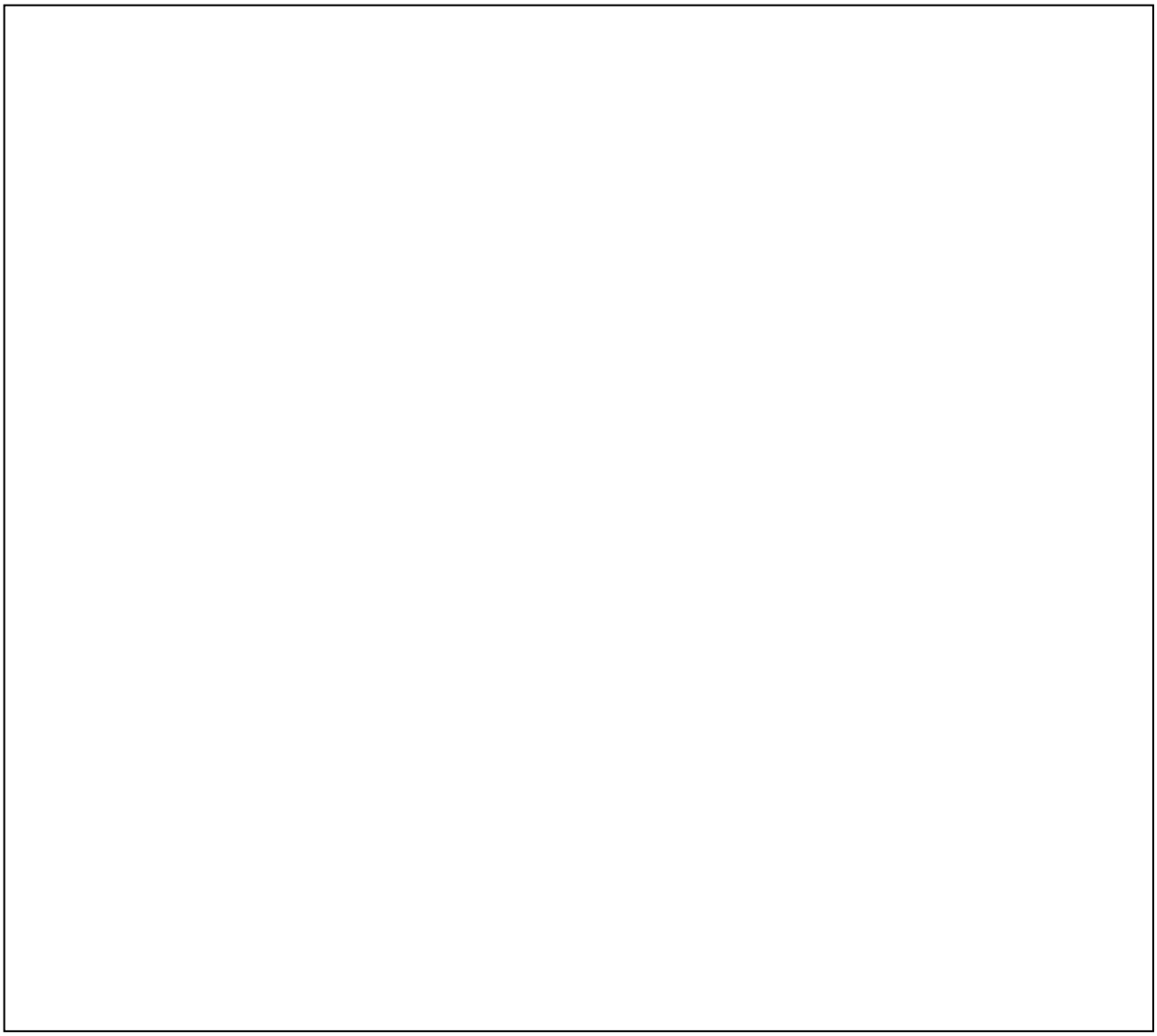
Source: IPIR, PIMAR, and EIA-814

The volume being exported amounted to about [redacted] of product, and in the export case, the majority of the volume exported was unfinished products, including blendstocks. Overall, Hawaii processed about [redacted] crude oil over the same period, and in order to balance demand needs with refinery capability, about [redacted] of imports were required and about [redacted] of exports. The movement of products into and out of Hawaii is therefore critical to the continuity of supply of petroleum products in the state. Inability to move product in or out could quickly result in supply shortages if imports were curtailed or unavailable. Exports are essential to avoid surplus unfinished product which could require crude processing reductions to control inventory.

It is noteworthy that in the first half of 2008, reduced crude runs have increased the need for imports, averaging [redacted] Exports declined to [redacted]

The import total in Exhibit 2.32 does not reflect ethanol imports to meet E-10 gasoline requirements beginning in 2006. Ethanol imports amounted to about [redacted] additional imported volume subsequent to initial deliveries in March 2006.

Exhibit 2.32 Ethanol Imports, 2006, 2007 and 2008 YTD



Source: PIMAR and EIA-814

Imported ethanol sources were primarily from the Caribbean, with the likelihood that the origin country was Brazil (Brazil exports ethanol to the Caribbean where it is processed to be denatured for ultimate export for fuel blending). As noted, in late 2007 and into 2008 companies reported predominantly imported ethanol from California.

Import Analysis

The volume of imports into Hawaii is dominated by jet fuel as seen on Exhibit 2.33. Despite high refinery production levels, on average over the study period about [redacted] of jet fuel was imported to meet demands. [redacted] It is possible that the developing global economic slowdown may reduce the demand for jet fuel and therefore slow import requirements.

Residual fuel imports occur sporadically as required to meet demands, averaging [redacted] over the period. Gasoline imports are virtually non-existent, and diesel imports are also low. However, imports of lower sulfur diesel increased in mid 2006 and have continued. The lower sulfur diesel is more difficult to produce in the Hawaii refineries.

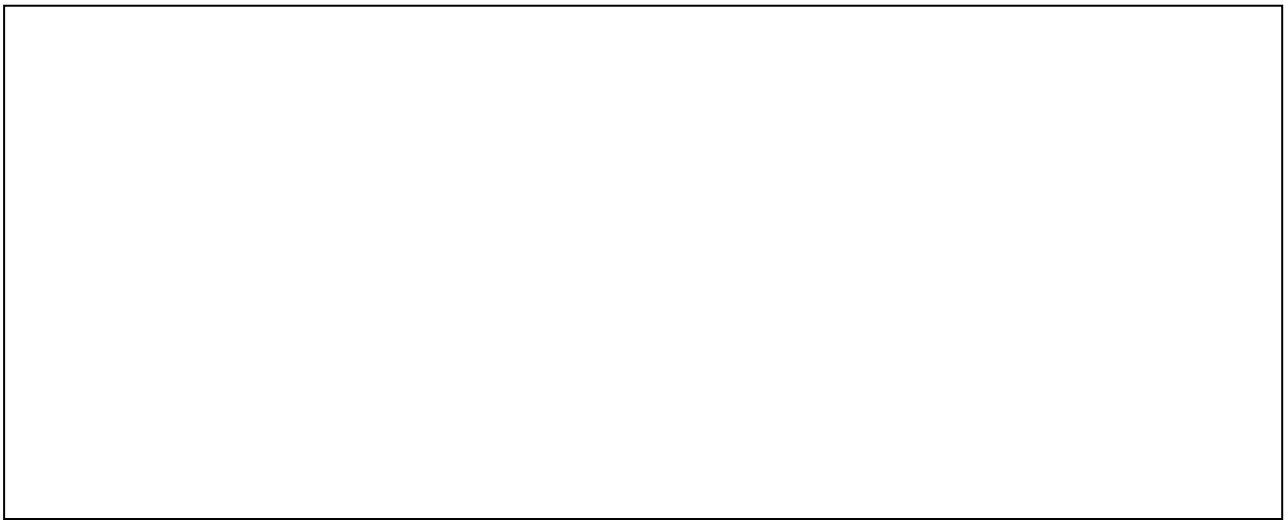
Exhibit 2.33 Hawaii Import Volume Detail

Sources: IPIR, PIMAR and EIA-814

Export Analysis

Refiners will export product from a region when the market in that region does not have an economic demand for the product versus other alternatives. The table below (Exhibit 2.34) below shows the volumes of exports out of the Hawaii market over the study period. The export table shows a high level of exports in 4Q 2007 likely related to Tesoro operating problems.

Exhibit 2.34 Hawaii Export Volume Detail



Source: IPIR and PIMAR

The export volume table indicates that subsequent to the implementation of the ethanol mandate in May, 2006 and the low sulfur on-road diesel mandate in June 2006, several trends emerged. First, exports of gasoline and gasoline blendstocks from Hawaii increased somewhat. This likely occurred for two reasons: 1) addition of [redacted] ethanol into Hawaii's gasoline supply reduced demand for refiner produced gasoline and 2) the greater difficulty in producing HIBOB gasoline for blending ethanol resulted in surplus supply of more difficult to blend gasoline components.

Second, exports of higher sulfur diesel fuel increased following the low sulfur diesel implementation, as well as exports of unfinished oils. Both may reflect the difficulty in converting some refinery crude oil gas oil or secondary unit gas oil streams into low sulfur diesel.

Moving unfinished gas oils or gasoline blendstocks into other markets where a company's other refineries, or another refiner's facility may be better equipped to process or blend the volume into saleable product is usually a far more economic choice for a refiner than simply reducing Hawaii crude runs to balance supply (because that will disrupt the balance of the other key refinery products). The very poor refiner margins in 2008 have prompted refiners to reduce crude runs which has tended to result in less required export of products this year.

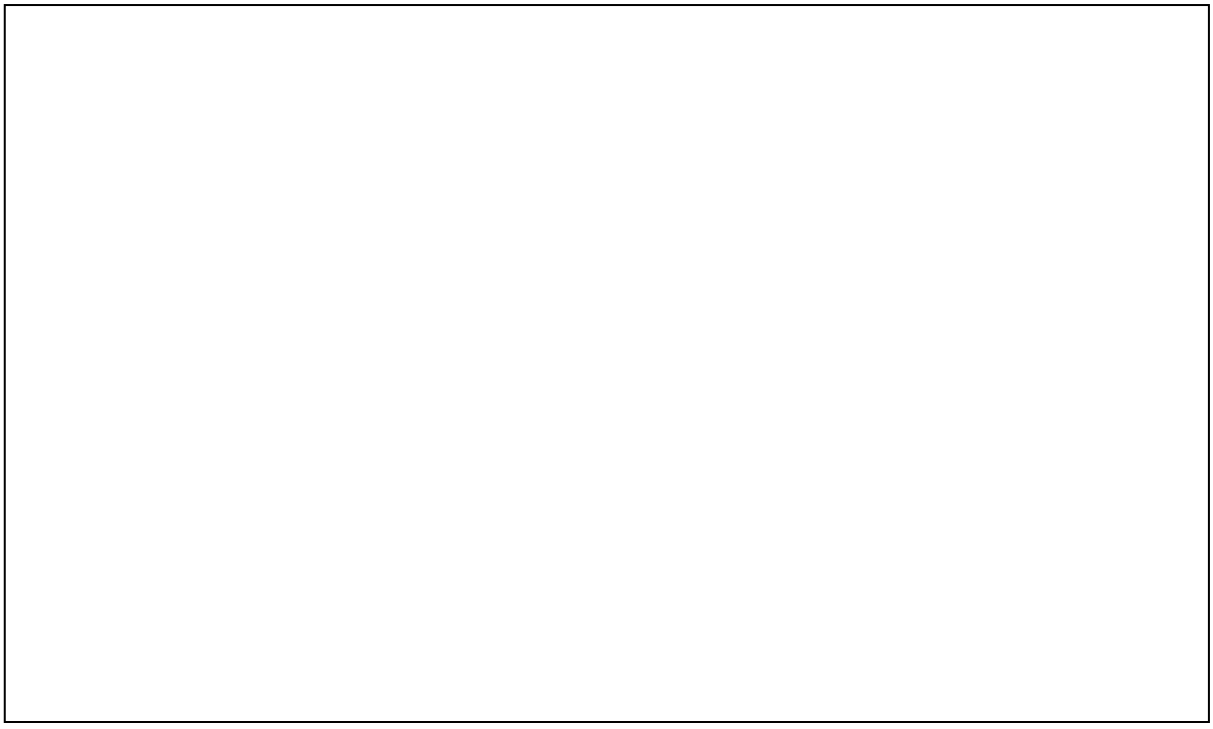
Distribution and Sales

One of the intents of the PIMAR system is to be able to identify trends in petroleum product sales information in the study periods, including trends in sales for the state as a whole and within each zone. The PIMAR data through the W-130 form collects information on sales transactions which permit this analysis.

Gasoline Sales

Gasoline Sales Customer Base and Trends: Sales of gasoline in Hawaii are primarily to traditional service stations, with gasoline sold on a "DTW" basis (Dealer Tank Wagon delivery). The service station pays a delivered price for the product to the refiner, supplier or jobber. However, other customers receive product on a DTW basis, including military bases, Hypermarketers and other Commercial accounts (e.g. rental car companies). The relative sales levels to these different customer bases over the study period are shown in Exhibit 2.35 below. The sales patterns over the roughly three year period show generally stable demand levels, with some peaks in winter months and an apparent decline in service station sales in 2008.

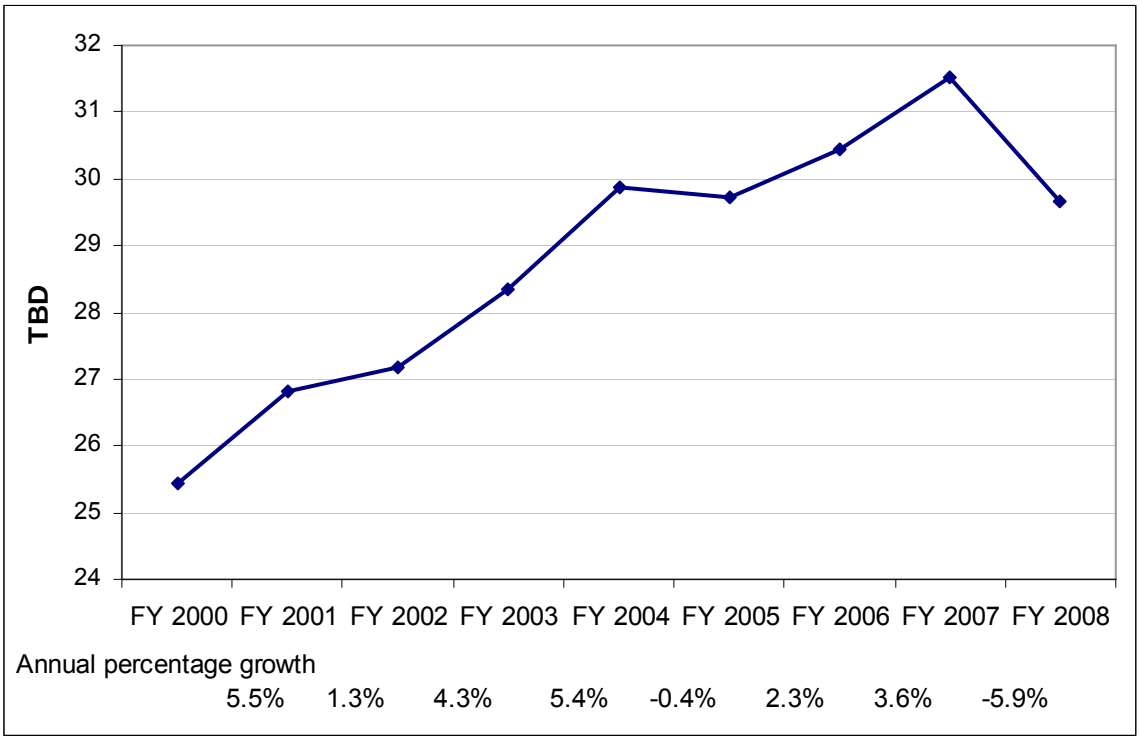
Exhibit 2.35 Hawaii Gasoline Sales by Channel



Source: IPIR, PIMAR and PUC Transactions Database

Exhibit 2.36 shows Hawaii gasoline sales over a longer period of time on a thousand barrels per day basis (TBD). The sales data are based on tax receipt data received by the Hawaii Department of Taxation. The sales have trended up over the longer period with an average annual growth of 2.5% through the 2007 fiscal year (ending mid-2007). Sales show a decided decline in FY2008 likely reflecting the impact of higher prices and the economic slowdown on tourism.

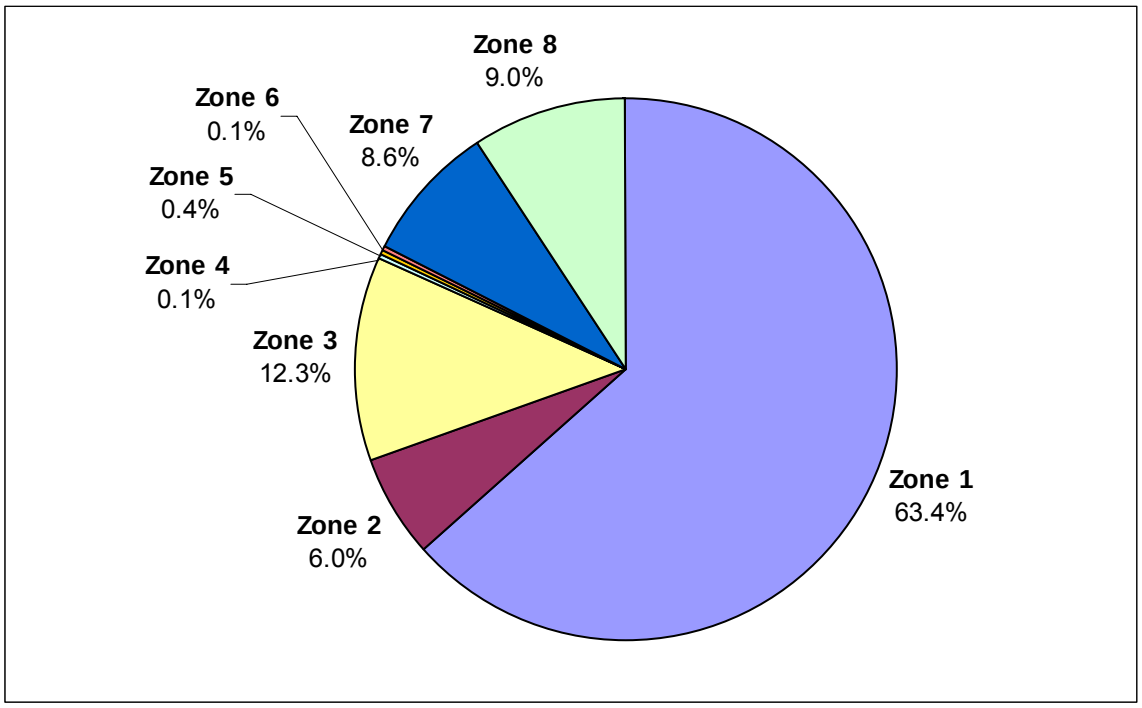
Exhibit 2.36 Hawaii Gasoline Sales Growth from FY 2000



Source: Hawaii Department of Taxation

Exhibit 2.37 shows a breakdown of gasoline sales by reporting Zone over the study period. The data show that over 60% of the sales are in Zone 1, with the Counties of Hawaii (Zones 7 and 8) and Maui having the second and third largest sales volumes.

Exhibit 2.37 Motor Gasoline Sales by Zone, Jan 2007–Jun 2008

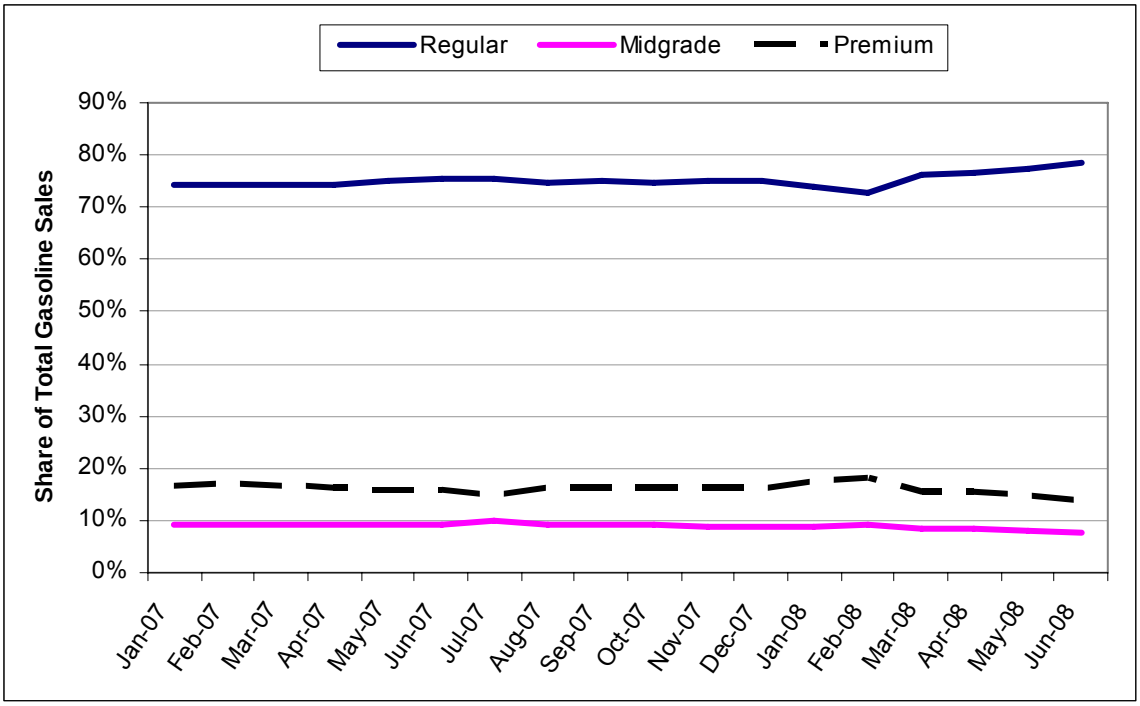


Source: PIMAR and PUC Transactions Database

Percentage of Gasoline Sales as Premium, Midgrade and Regular Unleaded

Exhibit 2.38 below shows trends in Hawaii gasoline sales from 2002 using data from the PIMAR system. The trend shows that the Hawaii consumers have been reducing the purchases of Premium grade gasoline since 2002, with Premium sales declining from under 25% of all gasoline sales to just over 16%. This is likely due primarily to price concerns, but may also stem from the recommendation in the 2003 Stillwater report to DBEDT that Hawaii consumers were unnecessarily consuming premium gasoline when regular would be adequate in many vehicles.

Exhibit 2.38 Motor Gasoline Sales Share by Grade

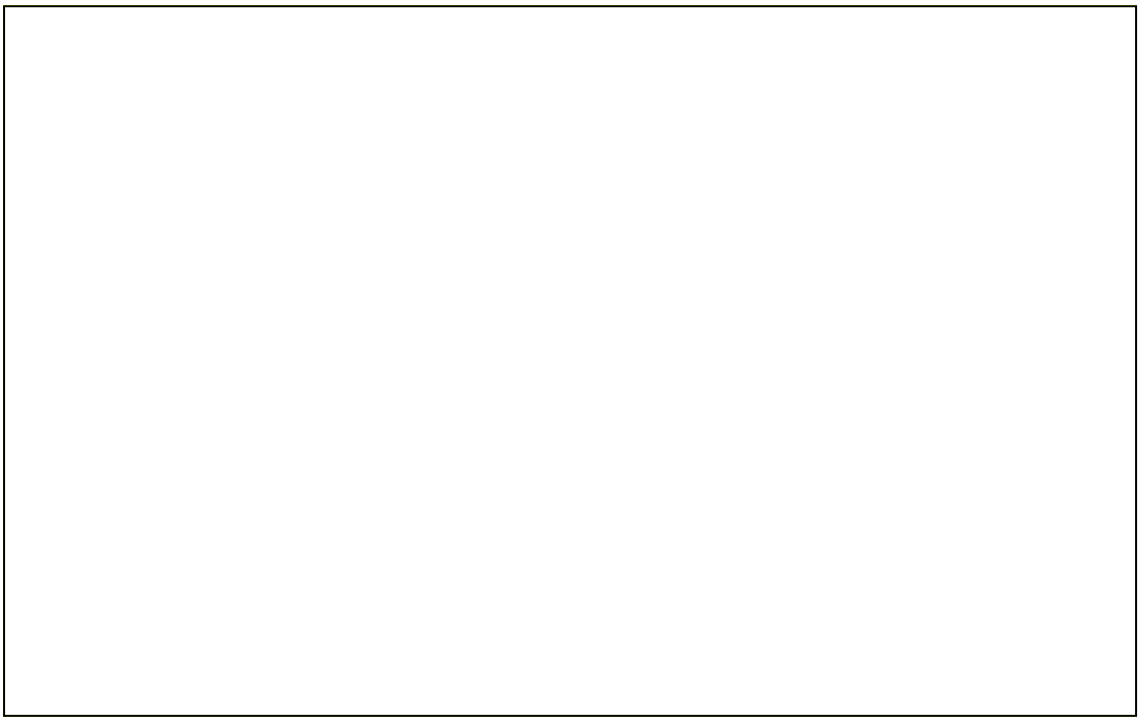


Source: PIMAR and PUC Transactions Database

Other Products

Exhibit 2.39 and Exhibit 2.40 show sales levels reported for jet fuel and diesel fuel (Diesel under 15 ppm sulfur, Diesel between 15-500 ppm and Diesel over 500 ppm sulfur). These exhibits are presented from 2007 to June 2008. There were data anomalies in the prior report, so these data rely strictly on the PIMAR information. While the PIMAR information is better, there are some remaining data issues related to categorization of the sales channels and clarification of issues such as transferred and exchanged products.

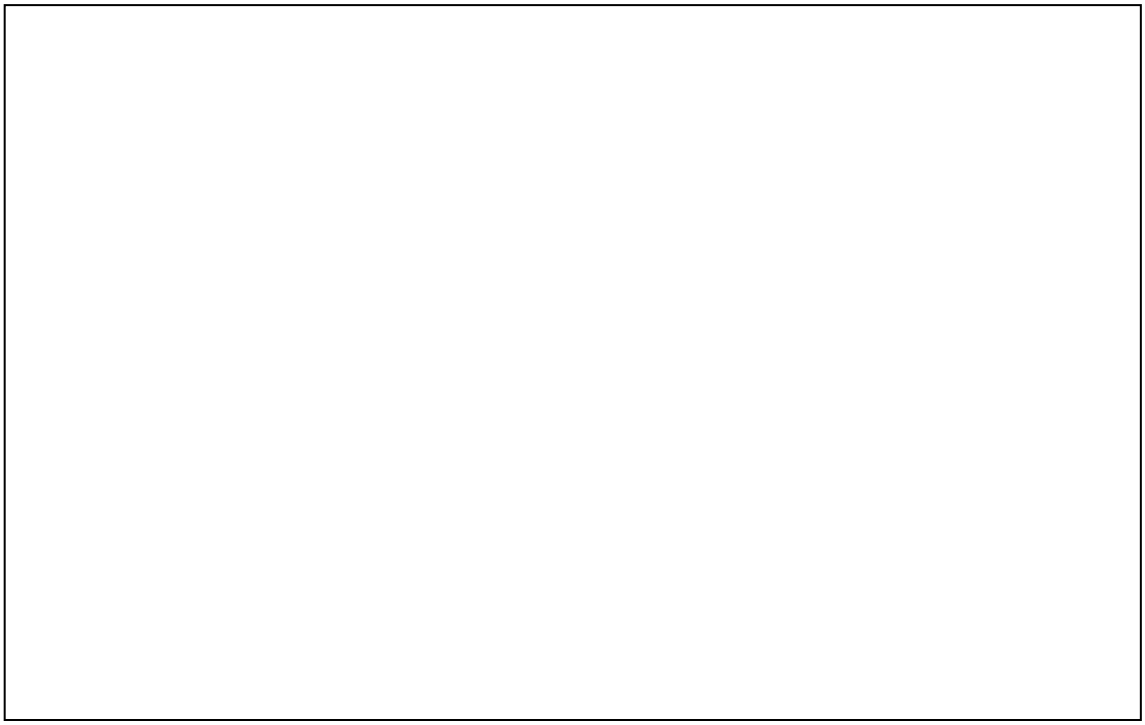
Exhibit 2.39 Estimated Jet Fuel Sales Trends



Source: PIMAR and EIA-814

Diesel sales trends show a definite impact of the changing sulfur requirements in diesel, with sales of 500 ppm diesel declining significantly in 2007, and sales of 15 ppm diesel increasing. These sales trends do not include sales of diesel fuel to utilities, which appear to not be included in the PIMAR reporting process.

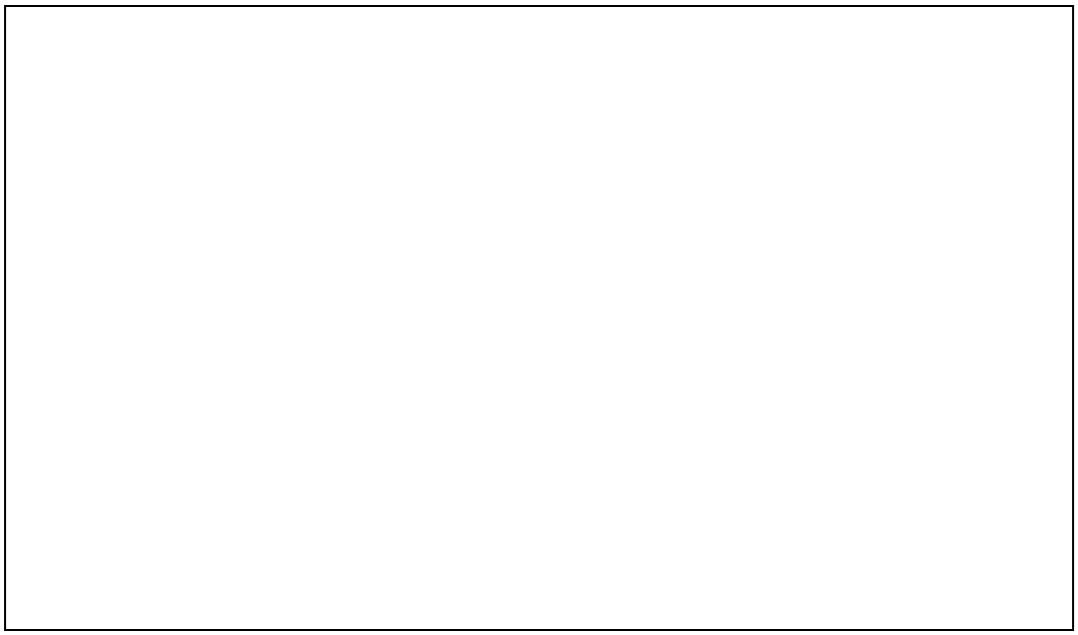
Exhibit 2.40 All Diesel Fuel Sales by Zone, Jan 2007–Jun 2008



Source: PIMAR and DBEDT

Exhibit 2.41 shows total diesel fuel sales by grade over the period.

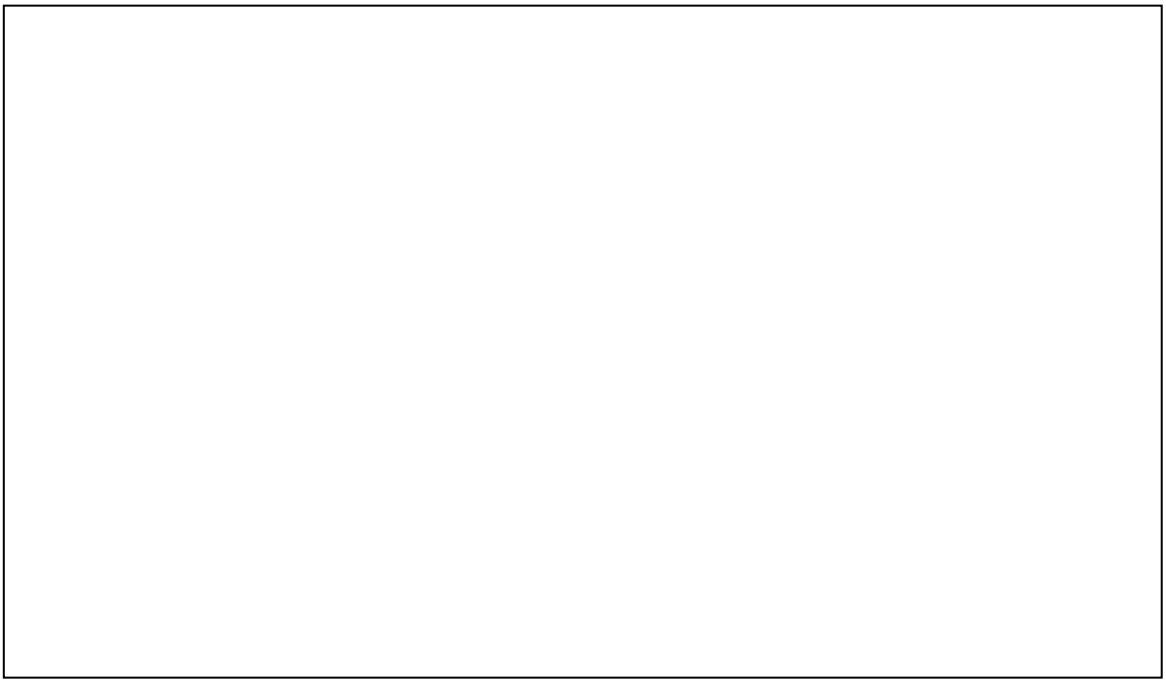
Exhibit 2.41 Non-utility Diesel Fuel Sales by Grade



Source: PIMAR

Exhibit 2.42 shows residual fuel sales levels by grade of residual fuel (over or under 1%). These sales volumes reported in IPIR for Zone 1 are more consistent with refinery reported data, with the exception of the initial couple months in the study period[15]. The data show that most of Hawaii's residual fuel production is under 1% sulfur. This is in large measure due to the low sulfur crude processed by Hawaii refiners. Similar to crude oil, lower sulfur residual fuel also will carry a premium in the commodity markets.

Exhibit 2.42 Residual Fuel Oil Sales Trend by Grade



Source: PIMAR

[15] Data in other zones is more periodic and inconsistent. Most of the state's residual fuel sales are in Zone 1.

3 Assessment of Gasoline Prices and Margins in Hawaii

This section of the report provides an extensive analysis of prices and margins in Hawaii over the study period. This section of the report incorporates the integration of IPIR data, PIMAR data including the PUC gasoline transaction database, as well as Platt's and OPIS market data to assess Hawaii prices and margins. There will be a significant portion on gasoline prices based on the requirement to analyze gasoline prices against the gas cap (both during the gas cap period and assuming it had been extended) and to determine and report gross margins for gasoline sales channels. This section will also incorporate an analysis of products such as jet, diesel, and residual fuels, which have a significant impact on Hawaii, and overall prices of these products versus market centers (West Coast, Singapore, etc) as well as versus Hawaii crude costs.

The information presented covers the state as a whole, and also the individual zones as identified in the Gas Cap legislation.

Gasoline Price Analysis

The gasoline price analysis will cover a wide range of information on Hawaii gasoline prices. The discussion is organized to cover the following areas in order:

- Gasoline Supply Chain & Classes of Trade
- Overall Price Trends
- Hawaii Prices vs. Gas Cap
- Supplier and Jobber Margins
- Retail Service Station Margins
- Gasoline Market Observations and Issues

This section of the report presents the findings from the analysis of the transaction data provided by the parties to the PUC over the study period, IPIR data, as well as global market pricing data for gasoline. The findings of the study are presented in a format to address the primary questions that were required to be evaluated:

1. Comparison of gasoline prices in Hawaii to the gas caps, both during the Gas Cap period and after the Gas Cap was suspended

2. Identification of actual margins for the suppliers (who buy from refiners) and jobbers (who buy from suppliers and refiners) in Hawaii based on data reported to the PUC

3. Identification of retail service station margins for gasoline dealers in Hawaii

4. Potential for improving competition and efficiency of the wholesale gasoline market in Hawaii, as well as reducing gasoline prices

The findings presented are believed to represent an accurate representation of prices and margins over the study period utilizing actual price data. The discussion on the gasoline market and prices follows.

Gasoline Supply Chain and Classes of Trade

Characterization of the Gasoline Market in Hawaii

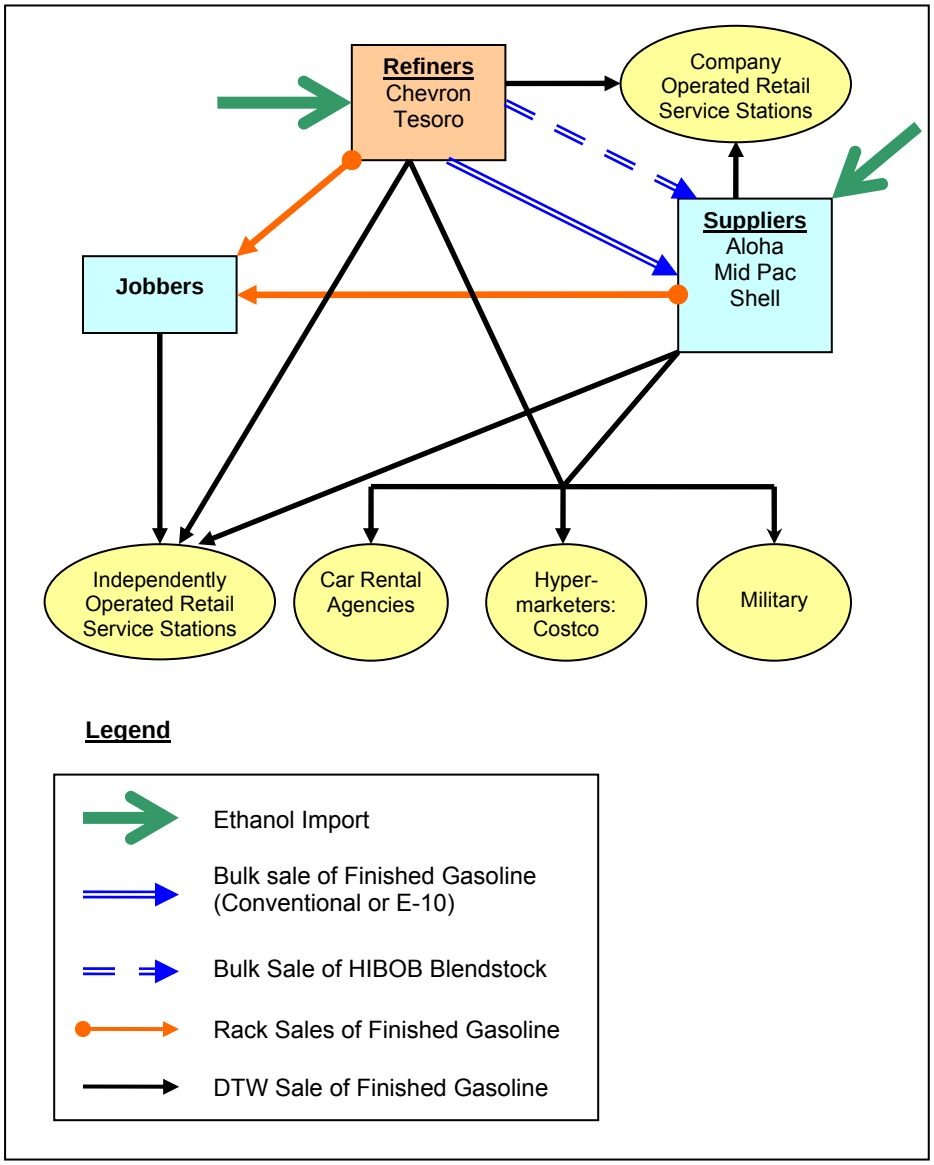
The gasoline market in Hawaii has a number of characteristics different than other markets in the United States, primarily stemming from its geographical isolation from alternative sources of supply.

The gasoline supply is provided from the two refineries in the state, Chevron and Tesoro, with minimal historical need for gasoline imports. The gasoline consumed in the state has been "conventional" gasoline, and as of May 2006, the gasoline has been blended with 10% ethanol. Ethanol is blended in essentially all the gasoline in Hawaii, with the exception of Zones 5 and 6 (Molokai and Lanai), which receive "conventional" gasoline due to the low volumes sold in those zones and costs to modify tankage.

The Gasoline Supply Chain in Hawaii

The gasoline supply chain is depicted in Exhibit 3.1. This Exhibit and the various channels of trade were described in the 2007 PIMAR report. This description is incorporated in the Appendix of the 2008 report.

Exhibit 3.1 Hawaii Gasoline Supply Chain



Gasoline Price Trends

The period of study is from September 1, 2005 through June 2008. During this period, global oil markets were volatile, and have remained volatile. Exhibit 3.2 tracks the gasoline prices in Hawaii over the study period versus key benchmark gasoline prices. The prices charted include spot market prices for U.S. Gulf Coast unleaded, Singapore 92 octane unleaded[16], the average Zone 1 service station wholesale DTW price, and average service station pump price (including taxes). This exhibit follows a similar pattern to the crude costs, but with far more volatility. Gasoline prices fell dramatically everywhere at the beginning of the period in the months after

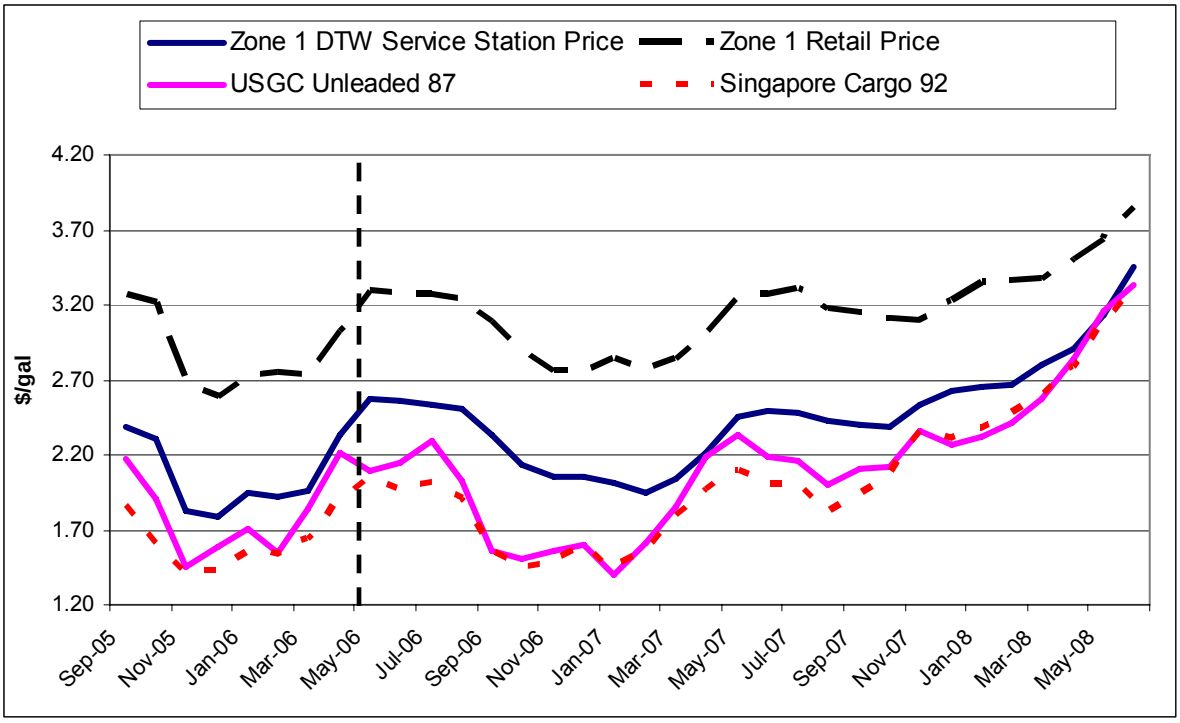
[16] Singapore 92 octane is a Research octane number equivalent to 87 Road octane regular gasoline.

Hurricanes Katrina and Rita, and then have experienced significant spikes in both the springs of 2006 and 2007. The spring period is typically prone to price spikes as U.S. refiners typically perform maintenance during this period, and also must convert the gasoline produced to a lower RVP[17]. The extent of the problems in both years were greater than normal due to extended repairs required post-Katrina, and multiple operational problems which kept refinery throughputs lower than normal for a longer period. The result was tight gasoline inventory and higher prices relative to crude oil.

The higher prices in mainland U.S. attracted increased levels of foreign imports, and, coupled with restored refinery runs in late summer 2006, prices began an extended decline. Hawaii prices mirrored these changes, in particular through April 2006, the last month the gas caps were in place. Singapore prices followed the U.S., but with more muted peaks and valleys. The Hawaii DTW and retail prices are well above the U.S. and Singapore spot prices, which is expected since the Hawaii prices are not spot prices but wholesale delivered prices and retail prices (with taxes). The intent is to show that Hawaii prices have moved with global markets both during and after the Gas Cap period.

From mid-2007, global prices began an extended increase which continued through the study period to mid-summer 2008.

Exhibit 3.2 Hawaii and Global Gasoline Price Trends

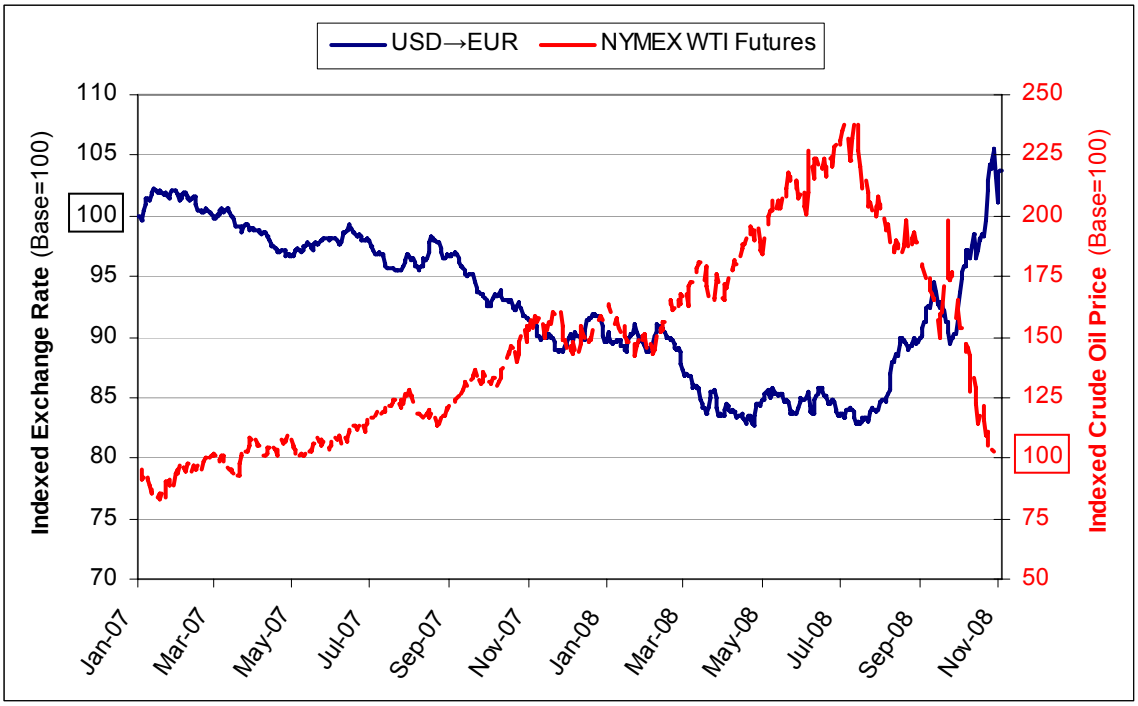


Source: Zone 1 DTW- PUC Transaction Database; Zone 1 Retail- OPIS; USGC & Singapore- Platts.

[17] Lower RVP means lower vapor pressure, required by the EPA and also necessary to reduce vapor lock potential during the summer.

Significantly, the value of the U.S. dollar had steadily declined versus other currencies in 2007 and 2008 which caused global crude prices (which are traded in dollars) to rise. The impact of higher and higher prices on U.S. and global consumers finally began impacting demands in early 2008 (as seen on Hawaii's gasoline sales on Exhibit 2.36). Subsequent to the end of the study period, in September and October 2008 the very rapid decline in petroleum prices occurred due to global product oversupply due to lower demands, but also a very rapid *rise* in the value of the dollar versus the Euro and other currencies (see Exhibit 3.3).

Exhibit 3.3 Value of the Dollar and the Price of Oil



Source: Exchange rate – OANDA.com; NYMEX futures – EIA

The key conclusions are that supply and demand are a factor in the rise and fall of oil prices, but the value of the U.S. dollar versus other currencies was likely a significant issue as well in 2007 and 2008.

For Hawaii, Exhibit 3.2 shows several very significant changes in the 2007-2008 portion of the study period. In 2008, as global prices steadily rose, Hawaii DTW prices (wholesale prices delivered to service stations) did not increase as quickly as global markets. For March through June of the study period Hawaii DTW prices actually were near or at spot market prices in Singapore or the U.S. Gulf Coast. This means that the Hawaii gasoline market prices, *delivered at service stations* were well below import parity plus the cost to transport products to the service station.

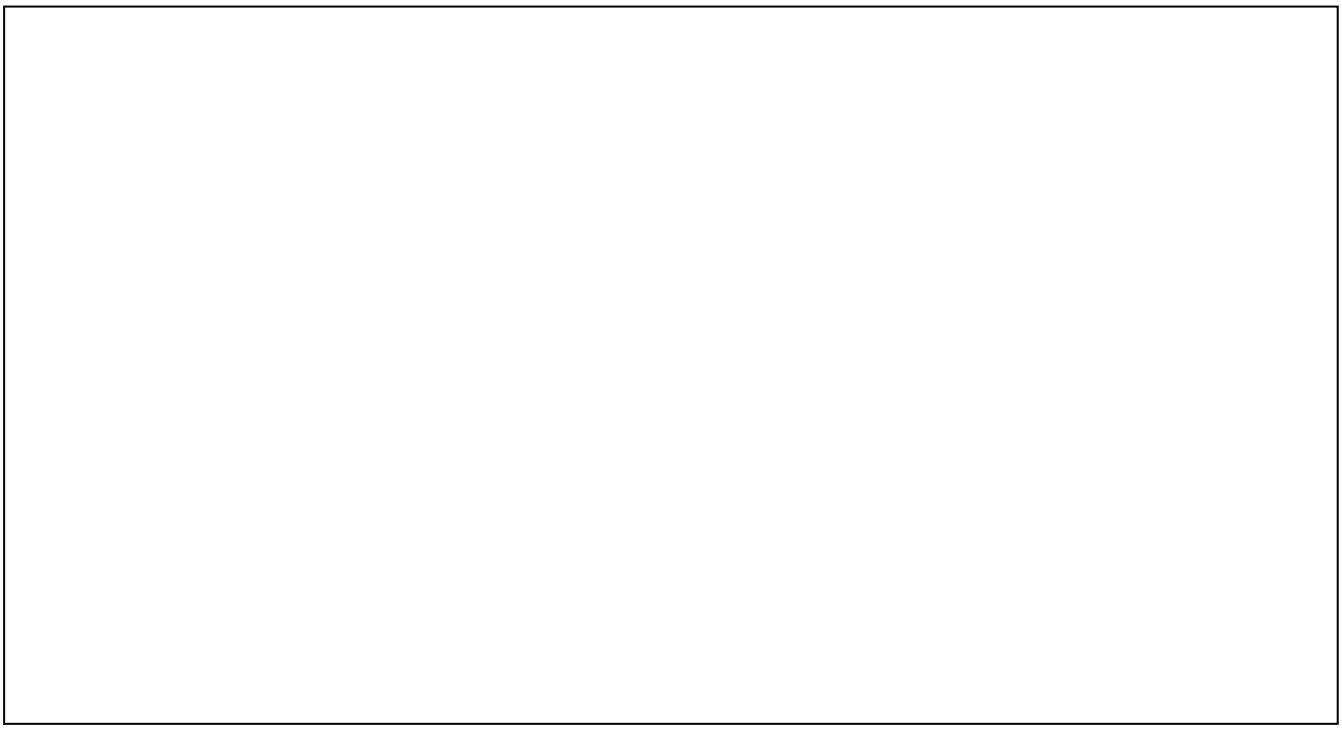
The weak market for gasoline in Hawaii may have been a result of lower consumer demand as seen in the most recent data from the Hawaii Tax records. The refiners' ability to market gasoline at historical import parity or better prices may have been a factor in decisions to reduce crude runs in 2008 (although refiners will look at complete margins including the value of jet, diesel, etc as well as gasoline).

Exhibit 3.4 below tracks Hawaii Zone 1 gasoline DTW prices versus Hawaii landed crude costs. Key takeaways are that during the gas cap period the DTW price did not track the crude cost well at all times. Hawaii DTW prices declined significantly in October 2005 following restoration of US gasoline supply following the hurricanes (this reduction was driven by the gas cap formula). Similarly, DTW increases in spring 2006 were driven by the gas cap increases based on the gas cap formula (all three U.S. market price markers increased over the period, in particular Los Angeles). In both cases the crude price was (comparatively) stable.

Subsequent to the gas cap suspension, the DTW and crude price relationship appeared to be more in sync. However, it is important to note that the "spread" between the DTW price and the crude price represents a margin of revenue for refiners. In all global markets, that "spread" will rise or fall based on the relative supply and demand for gasoline in that market. When refining capacity is tight, or when demands outpace supply, the gasoline to crude spread will widen, indicating higher refining margins, higher prices to consumers, and higher refining profits.

As with the comparison with other gasoline markets in Exhibit 3.2, gasoline prices in 2008 in Hawaii did not rise commensurate with crude cost. This change in 2008 significantly narrowed the margin for gasoline sales for the two refiners. This will generally indicate a gasoline oversupply situation in the state, possibly driven by consumer responses to higher prices but also driven by the general downward trend in tourism with weak economic conditions in the U.S. and elsewhere.

Exhibit 3.4 Hawaii Zone 1 DTW Service Station Gasoline Price vs. Landed Crude Cost

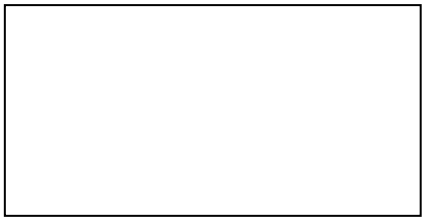


Source: IPIR, PIMAR, and PUC Transaction Database

Exhibit 3.5 shows in tabular form the change in margin over several study periods. Gasoline margins from DTW to landed crude cost ranged from [redacted] from the Gas Cap period through 2007, and then dropped to [redacted] through mid 2008. The drop from 2007 alone

[redacted] equates to about a [redacted] loss in refining gasoline margin in 2008 versus 2007. This was a benefit to Hawaii consumers compared to other U.S. markets, however to the degree it may have been fueled by reduced tourism consumption it may be a mixed blessing. For the refiners, it clearly affected profits and stimulated reduced crude runs over the period.

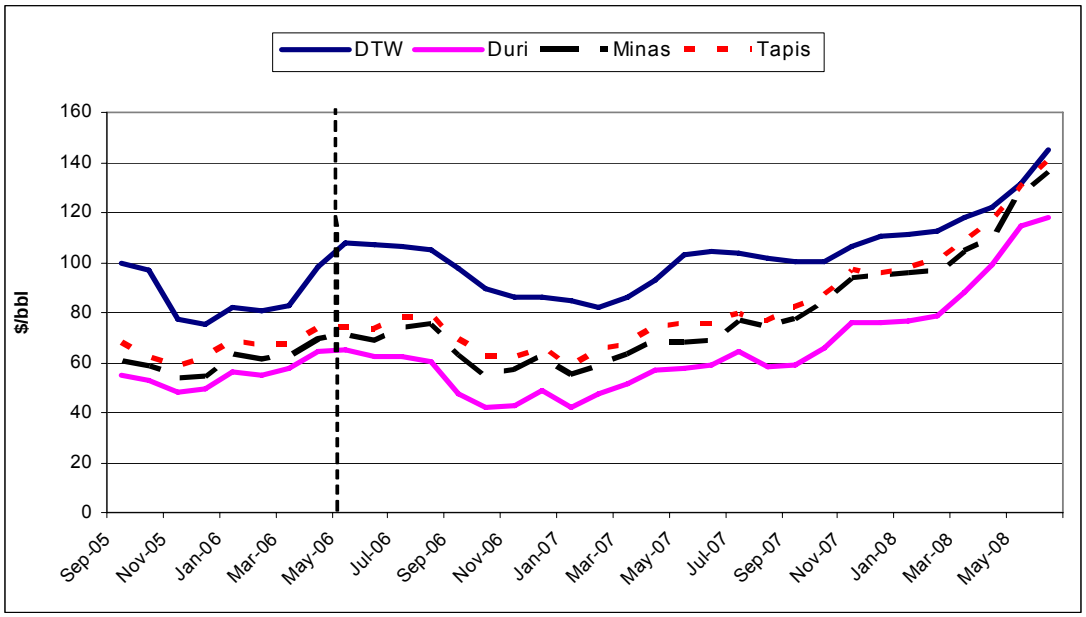
Exhibit 3.5 Average Price Spread, $/barrel



Source: IPIR, PIMAR, and PUC Transaction Database

A similar spread relationship exists when the Hawaii DTW price is compared to several of the typical crudes that have been processed in Hawaii refineries[18] (see Exhibit 3.6). This chart is similar to the landed crude cost exhibit, and basically demonstrates that Hawaii's DTW prices follow global markets. The chart also shows that there can be a wide disparity between specific types of crude oil. These three crudes from the Far East are all sweet (low sulfur) crudes, with different API gravities. The lighter (more easy to refine) crudes (Tapis and Minas) can carry a premium as high as $20/barrel over a heavier crude such as Duri. Duri will tend to produce more low valued residual fuel than the others and hence it has a lower market value.

Exhibit 3.6 Hawaii Zone 1 DTW Service Station Gasoline Price vs. Selected Crude Prices



Source: PUC Transaction Database and Platts

[18] These crudes are varying grades of Indonesian and Far East sweet crudes that have been processed in Hawaii, and are common crudes traded in the marketplace.

The next exhibit (Exhibit 3.7) tracks the Hawaii Zone 1 DTW price against several comparable global spot market prices for regular unleaded gasoline. This Exhibit is somewhat similar to Exhibit 3.2, but is presented to discuss the variation in Hawaii prices from other global markers in a bit more detail.

As noted, the Hawaii Zone 1 DTW price is a wholesale price that is a delivered price to the service station The DTW prices incorporate terminal and trucking costs and wholesale profits, and therefore are typically higher than spot market prices in any given market. However, DTW prices will trend with the spot markets, and the intent of this exhibit is to determine how well the Hawaii prices track various global gasoline markets.

Prior to the gas cap suspension the Hawaii DTW prices tracked the global markets, although it directly tracked the USGC 87, Los Angeles 87, and New York Harbor 87 prices (averaged together) because that was the gas cap formula base. When the gas caps were lifted in May 2006, the Hawaii DTW prices appeared to more closely follow the trend of the Singapore 92 octane gasoline pricing[19] than the other markers, although the general trends were similar. Additionally, the steep drop in U.S. spot gasoline prices from July to October 2006 (about 80 cpg) occurred at the same time a lower 55 cpg drop took place in Singapore. Hawaii DTW prices fell about 40 cpg in the same timeframe, much closer to the Singapore decline. When prices rose in the U.S. from January through May 2007 by 90-100 cpg, Singapore prices increased about 65 cpg while Hawaii DTW prices moved only 45 cpg.

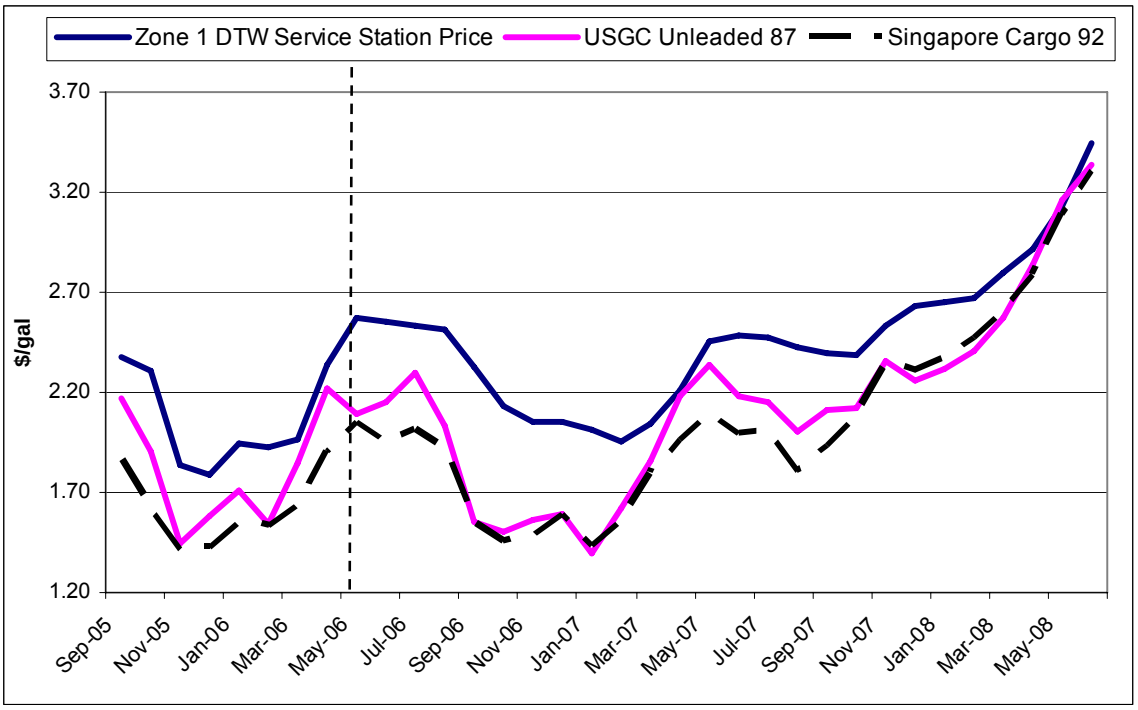
The U.S. price variations over this period reflected overall global trends in oil prices stemming from crude price declines and then increases, further impacted by local U.S. gasoline supply and demand issues. In late summer/fall 2006, healthy refinery runs and lack of hurricanes resulted in weaker U.S. refinery margins, and gasoline prices declined more than crude. In 2007, a sustained period of refinery outages (many unscheduled) coupled with lower imports of gasoline and high consumer demand caused U.S. gasoline prices to increase even more than crude price.

The global market changes noted above impacted Hawaii, however the impact was more muted than the U.S. average because the Hawaii market (*after the Gas Caps were suspended)* is no longer directly linked to the U.S. mainland. In addition, it appears that the Hawaii refiners and suppliers are linking their pricing actions (at least to some degree) based on changes in the Singapore market. Over this period, this also served to mute the volatility seen on the U.S. mainland.

As discussed earlier, this chart additionally shows that Hawaii service stations are receiving product in 2008 at prices that are at or even below some global price markers. This has a significant effect on both the refiners in Hawaii as well as the Suppliers who purchase product from them. This will be discussed in more detail.

[19] Singapore 92 octane is a 92 “Research” octane rating, comparable to the US conventional gasoline 87 “Road” octane rating.

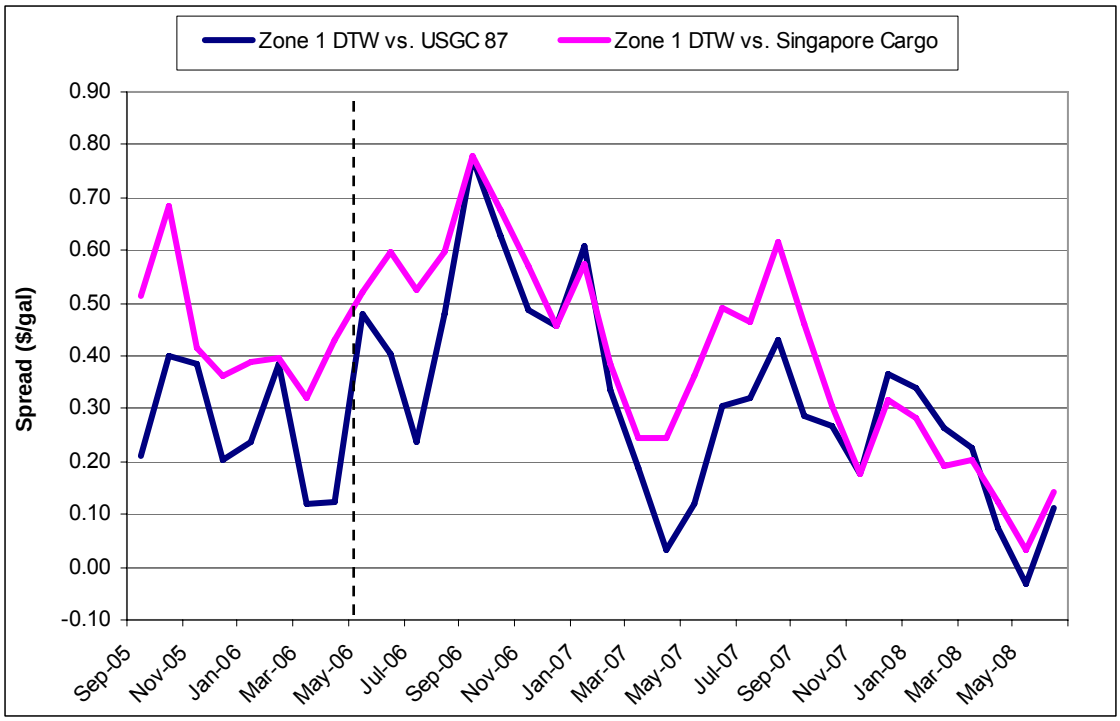
Exhibit 3.7 Hawaii Zone 1 DTW Service Station Prices vs. Global Gasoline Markers



Source: PUC Transaction Database and Platts

Exhibit 3.8 below tracks the Hawaii DTW prices as a difference versus the global prices shown above. This exhibit shows the relatively greater correlation, as indicated by the least amount of volatility in the price difference, between Hawaii DTW prices and Singapore, as compared to the U.S. Gulf Coast and Portland, Oregon markets. It additionally shows that the spread between Hawaii DTW prices and all marker prices, particularly the U.S. prices tends to narrow in the spring period (in 2006 and 2007) as those mainland markets tend to have higher prices during the spring refinery turnaround periods. This chart also clearly shows the rapid decline in these price spreads from January 2008 through the study period.

Exhibit 3.8 Spreads between Hawaii Zone 1 DTW Service Station Prices and Global Gasoline Markers

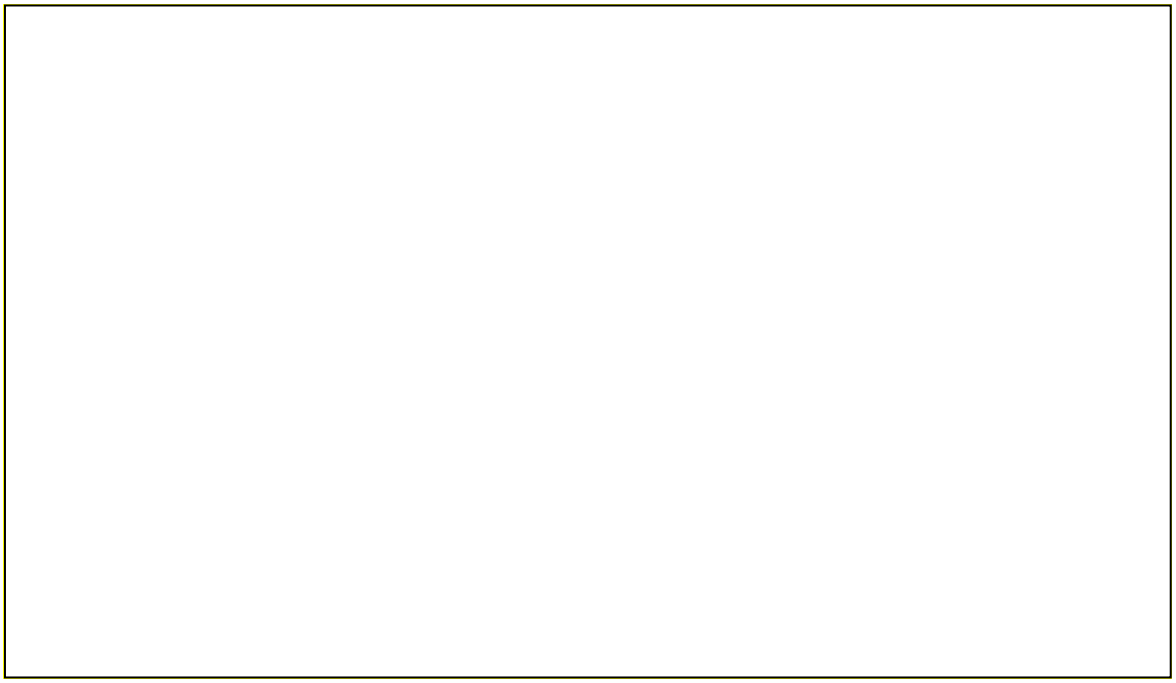


Source: PUC Transaction Database and Platts

The next exhibit (Exhibit 3.9) compares the Bulk based gasoline prices in Hawaii versus the same global gasoline market benchmarks. The bulk prices FOB the refinery are the prices that the refiners have contractually agreed to sell wholesale gasoline to the primary suppliers in Hawaii (Aloha, Shell and Mid-Pac). The actual bulk prices shown are weighted averages of bulk transactions based on commercial agreements between the refiners and the three major suppliers (Aloha, Mid-Pac and Shell).

Unlike the prior exhibits which compared service station DTW prices, this exhibit is comparing bulk prices FOB a refinery in all markets, including Hawaii. It is clear from this exhibit that the trends in bulk prices FOB refineries in Hawaii are tracking global marker prices far more closely than the trends in Hawaii DTW prices. Since refiners and suppliers negotiate commercial contracts based on other global markets plus a location premium, this is not a surprise. The ramifications of this on Hawaii suppliers however can be very significant if the Hawaii gasoline market can not support an import parity plus price, which has occurred in 2008.

Exhibit 3.9 Hawaii Zone 1 Bulk Prices vs. Global Gasoline Markers



Source: PUC Transaction Database and Platts

Exhibit 3.10 below takes the prices in Exhibit 3.9 above and identifies the price spreads between Hawaii bulk prices and the global markets. There are several key points.

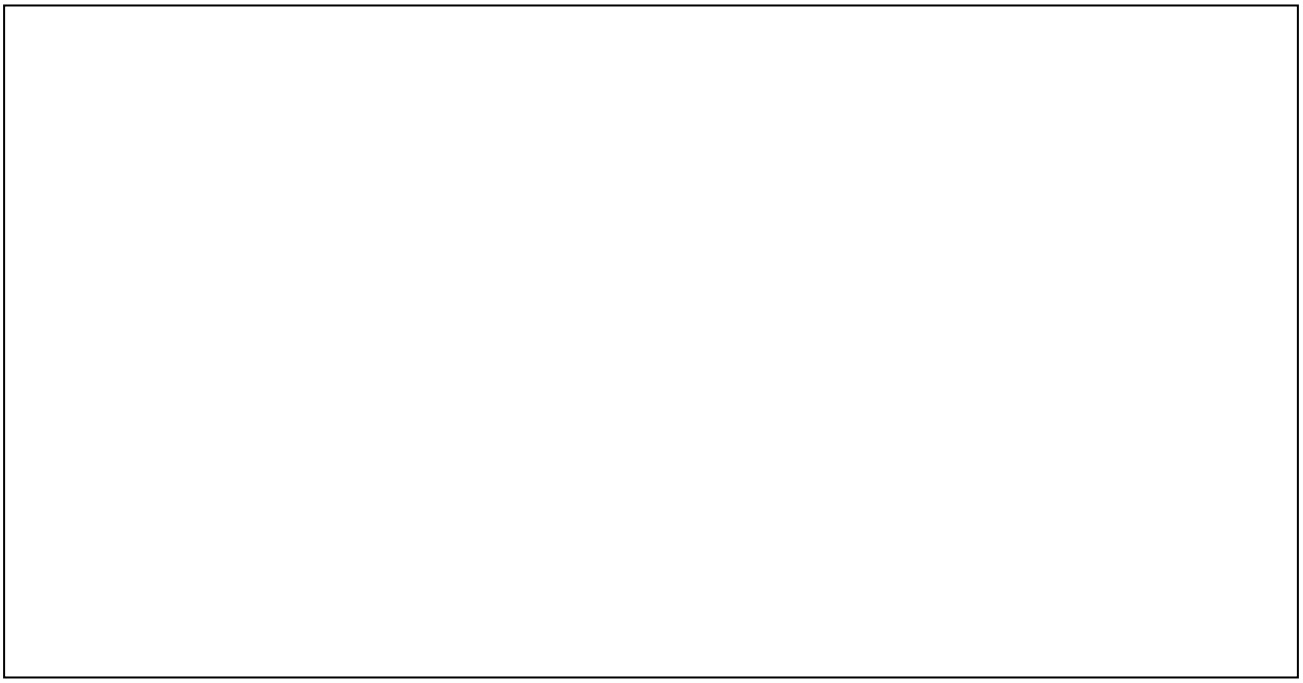
First, the Hawaii bulk prices appear to have a relatively steady offset from both the Gulf Coast and Singapore prices over the entire period. Although the prices are offset by about [redacted] respectively, and have some variation, they tend to be in a relatively stable band.

Second, the apparent correlation between the Hawaii Bulk price to suppliers and the Singapore and Gulf Coast prices corroborates the view that the commercial terms with suppliers reflect a baseline price from both markets plus a location differential into Hawaii reflecting freight costs. This indicates that the refiners and suppliers are attempting to price bulk gasoline at a competitive value versus the most appropriate alternate supply options into Hawaii.

The implications of this chart are very significant. Suppliers (Aloha, Mid-Pac and Shell) are paying for their gasoline supply based on bulk contracts with Chevron or Tesoro which were constructed to reflect a mutually agreed formula for import parity from other markets. This means that in 2008 as actual DTW price spreads in Hawaii collapsed to be at or near market prices in Singapore or the Gulf Coast (i.e. before shipping cost or transport to service station costs), these suppliers were paying more for their product than they could recover in the market.

Barring any contractual alterations which may have been arranged to reflect these market conditions, the major suppliers should have had very poor margins in the first half of 2008. The refiners would have had similarly poor margins for gasoline as well, although their sales to the three main suppliers would have provided the refiners with a portion of their refinery gasoline sales at import parity price.

Exhibit 3.10 Spreads between Hawaii Zone 1 Bulk Prices and Global Gasoline Markers



Source: PUC Transaction Database and Platts

Exhibit 3.11 shows the margins in four separate timeframes represented on the chart. This shows the fairly consistent relationship to the Gulf Coast and Singapore prices, while indicating that the Singapore pricing has narrowed versus the Hawaii market in 2008.

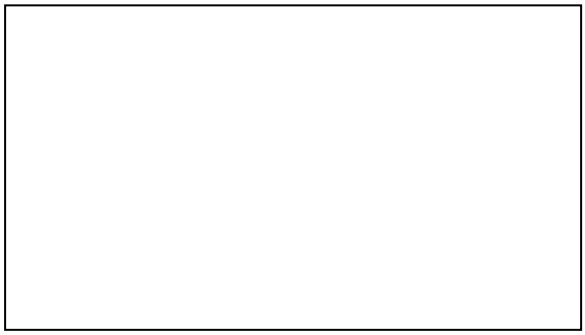
Exhibit 3.11 Tabular Spreads Between Hawaii Zone 1 Bulk Prices and Global Gasoline Markers during Various Periods, Regular

Time Period	Hawaii Bulk vs. USGC ($/gal)	Hawaii Bulk vs. Singapore ($/gal)
Pre Gas Cap		
2006 Post Gas Cap		
2007		
2008 YTD		

Source: PUC Transaction Database and Platts

As noted earlier, there are several different classes of trade that take place within the DTW sales category. Comparisons of DTW price in this report to the gas cap, crude price, etc., have used the service station DTW price, since that is the primary gasoline price visible to consumers, and the largest percentage DTW volume. However, there are three other sales channels evident from analysis of the transaction database. The channels and relative volume percentages and prices for Zone 1 are noted in Exhibit 3.12 below:

Exhibit 3.12 Hawaii DTW Sales Channels and Price Comparisons, Zone 1



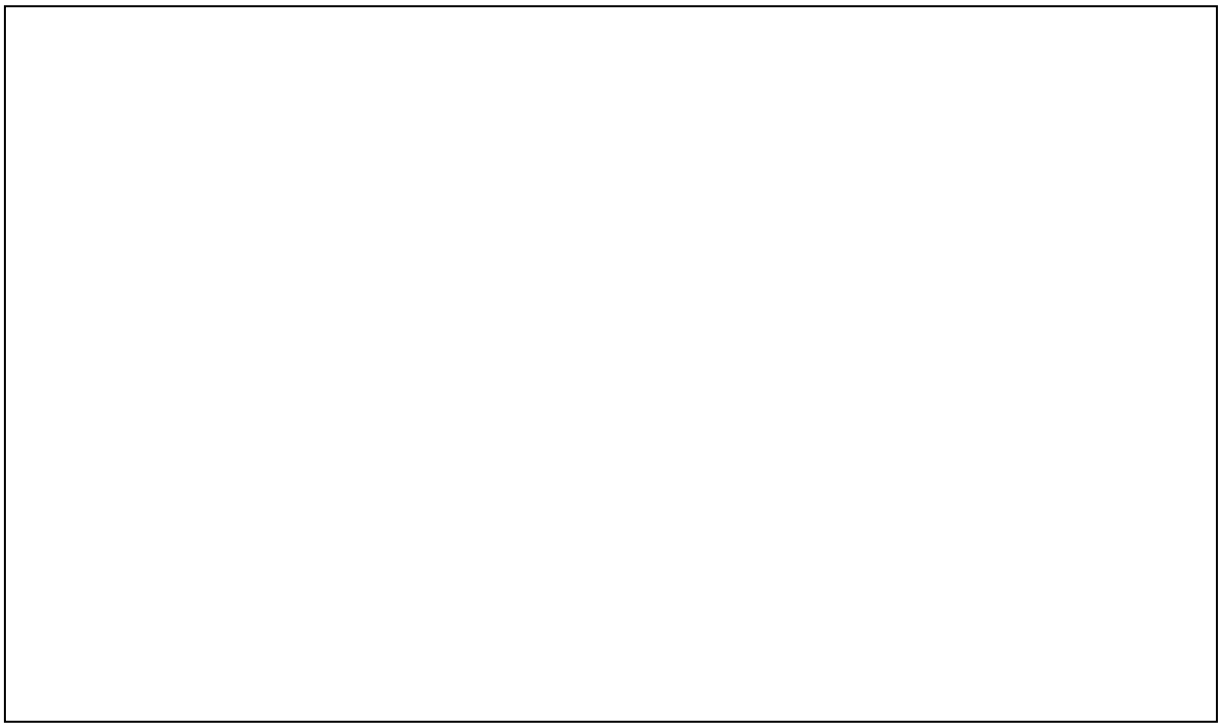
Source: PUC Transaction Database

Commercial sales are fairly close to service sales in price, and represent a relatively small percentage of total DTW sales (rental car agencies, etc). Sales to the military are well below service station DTW prices, and represent about [redacted] of total DTW sales over the period. The military prices are lower because the seller has virtually no costs associated with the dispensing of the gasoline at the military base. DTW sales of branded gasoline at service stations can include multiple costs to the supplier for branding, advertising, signage, rent, taxes, maintenance, etc which are all incurred by the military facility. Similarly, sales to hypermarketers such as Costco can be negotiated at prices well below service station DTW prices for the same reasons as the military.

The next exhibit (Exhibit 3.13) clearly shows that the different DTW trade classes have very different price profiles versus service station sales. It is likely that the contractual agreements between suppliers and the non-service station accounts are negotiated on an annual basis, or some basis other than the daily or frequent price changes that occur for service stations, and the prices appear to be tied to market prices in other areas (terms are not known). The trend in the relative pricing appears to indicate that the rather significant discounts to service station prices enjoyed by the military and hypermarketers narrow significantly in a rising spot market and inflate in a falling spot market, indicating the timing of military and hypermarket DTW prices are more directly tied to spot market changes than service station prices.

This exhibit shows that all 4 channels of DTW sales follow each other with the market. However it is apparent that Costco prices in 2008 are no longer at an advantage versus retail service stations, and the military advantage is also smaller. This appears to indicate that Costco's contract with Aloha may be tied to import parity prices and Costco may therefore be paying higher prices than historically due to this. If military prices are also tied to some relationship with import parity, their advantage would also be significantly reduced in 2008.

Exhibit 3.13 Hawaii DTW Sales Channels' Price Trends, Zone 1



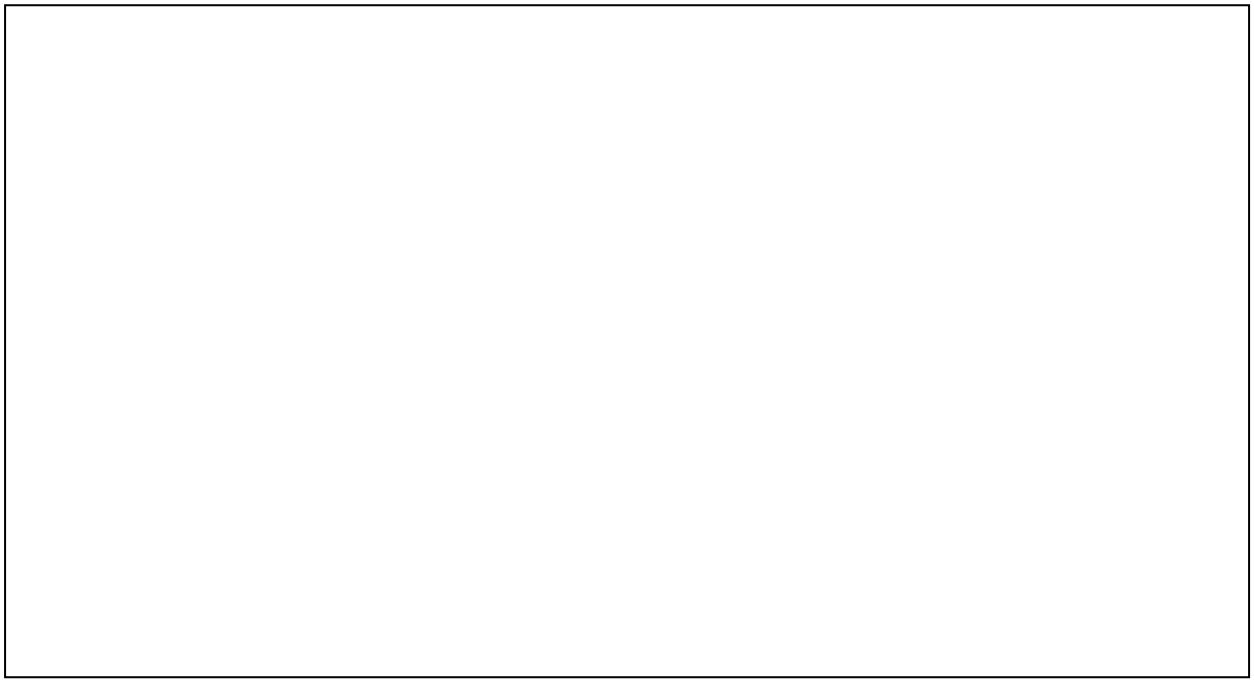
Source: PUC Transaction Database

The next exhibit evaluates the relative DTW prices in the other Zones versus Zone 1. This is to assess the relative premium charged for marketing on the other zones versus Oahu, and the analysis will focus on the trend in that spread pre-and post gas caps (i.e., did the elimination of the gas caps increase the spreads?).

The Gas Cap legislation recognized the higher cost to supply gasoline to the other zones relative to Zone 1 based on actual cost data provided by the parties. The trends in Exhibit 3.14 below indicate that zone pricing adjustments while the gas caps were in effect moved in lock step with the Oahu price changes (which makes sense since all service station DTW prices were kept at or near the price cap in all zones). Following the lifting of the caps, all zone prices (which the exception of the small volume zone 6 which has limited shipments) continued to move relatively closely with changes in the Oahu price.

The trend in service station DTW prices among the zones shows that they follow the overall pricing trend in Zone 1.

Exhibit 3.14 Hawaii DTW Service Station Sale Prices by Zone



Source: PUC Transaction Database

Exhibit 3.15 shows that the relative price premium in other zones versus Oahu has, on balance, remained relatively stable following the gas cap period. This is a key point demonstrating that the refiners and suppliers have not altered price patterns in the other zones over the period.

Exhibit 3.15 Hawaii DTW Service Station Sale Price Spread vs. Zone 1

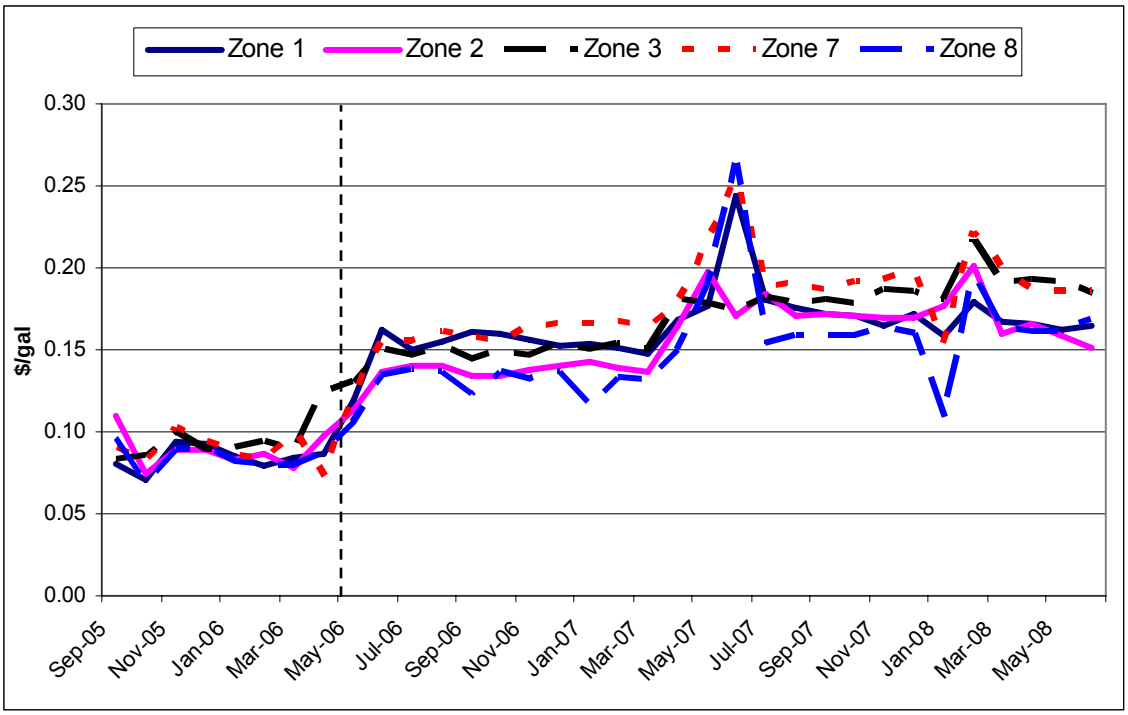
Period	2 vs. 1	3 vs. 1	5 vs. 1	6 vs. 1	7 vs. 1	8 vs. 1
Gas Cap	0.16	0.13			0.14	0.17
2006 Post Gas Cap	0.21	0.17			0.16	0.18
2007	0.18	0.18			0.14	0.17
2008 YTD	0.17	0.18			0.11	0.16

Source: PUC Transaction Database

The next area to evaluate is the pricing for premium and midgrade gasoline. Exhibit 3.16 and Exhibit 3.17 below track the spread in price between premium gasoline and regular, and midgrade and regular over the study period. The exhibits below indicate that the spreads for both premium and midgrade versus regular grade gasoline increased after the gas caps were suspended. In the case of premium, the increase was immediate and significant, with the spread increasing from about 10 cpg under the gas cap formula to 15-17 cpg for zones 1, 3 and 7, and 12 cpg for zones 2 and 8. The midgrade increase was in zones 1,3 and 7, and averaged about a 2-3 cpg increase. Zones 2 and 8 were flat to a slight decline.

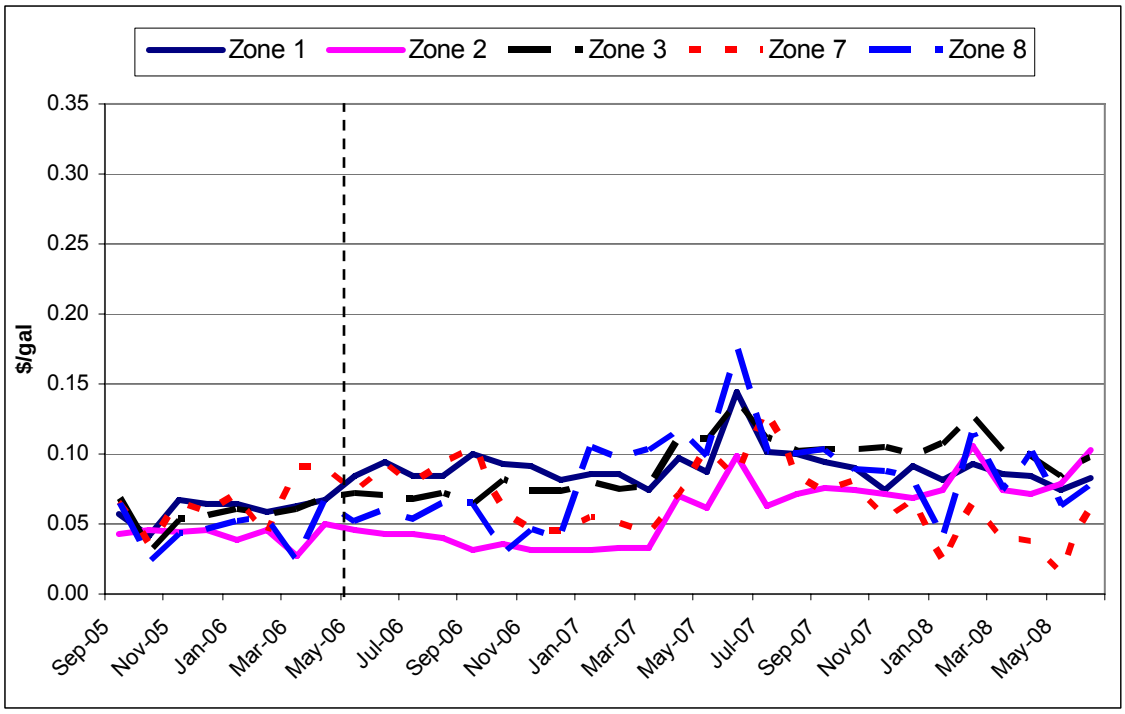
Premiums over the post-gas cap period have tended to average around 17 cpg for premium and 8 cpg for midgrade. As seen earlier, the sales percentages of the different grades in Hawaii has continued to show reductions in premium grade purchases and increases in regular grade gasoline. This may be in response to the overall price level of gasoline, or that retailers are increasing the street price of premium grades to recover the higher cost of wholesale supply. The increased tendency for consumers to purchase regular grade versus premium grades is similar to what is being seen nationwide. The refiners and suppliers are selling less premium grades, but are getting a better margin on those sales than during the gas cap period.

Exhibit 3.16 Hawaii DTW Service Station Price Spread, Premium Gasoline vs. Regular



Source: PUC Transaction Database

Exhibit 3.17 Hawaii DTW Service Station Price Spread, Midgrade Gasoline vs. Regular



Source: PUC Transaction Database

One rationale for wholesale DTW prices for premium grades being higher is that the bulk price to suppliers may have changed based on the commercial terms for bulk transactions. Exhibit 3.18 shows how the bulk price for premium grade sales to suppliers changed over the study period (note that there are no midgrade bulk sales; midgrade is normally a blend of premium and regular grade components at the terminal).

This exhibit shows that the actual cost that suppliers paid refiners for premium gasoline was above the actual premium that suppliers could recover in the market while the Gas Caps were in effect. This was particularly in the first six months of operation under the gas cap. This would appear to indicate that the commercial terms for bulk transactions for premium gasoline did not match the premium gasoline zone adjustment of 9 cpg in the Gas Cap legislation, and suppliers could not recover their costs. Following suspension of the Gas Caps, costs to suppliers increased again, and in this period the suppliers were free to raise their prices for premium vs. regular and recover costs.

Bulk spreads for premium gasoline versus unleaded are volatile, but are typically well below the DTW spreads. DTW spreads will typically be higher than bulk spreads in a free market pricing environment as suppliers attempt to recover the costs of marketing premium grades and earn a profit above their cost. This chart shows that suppliers' premium sales to service stations have typically been profitable in the period following the suspension of the gas caps.

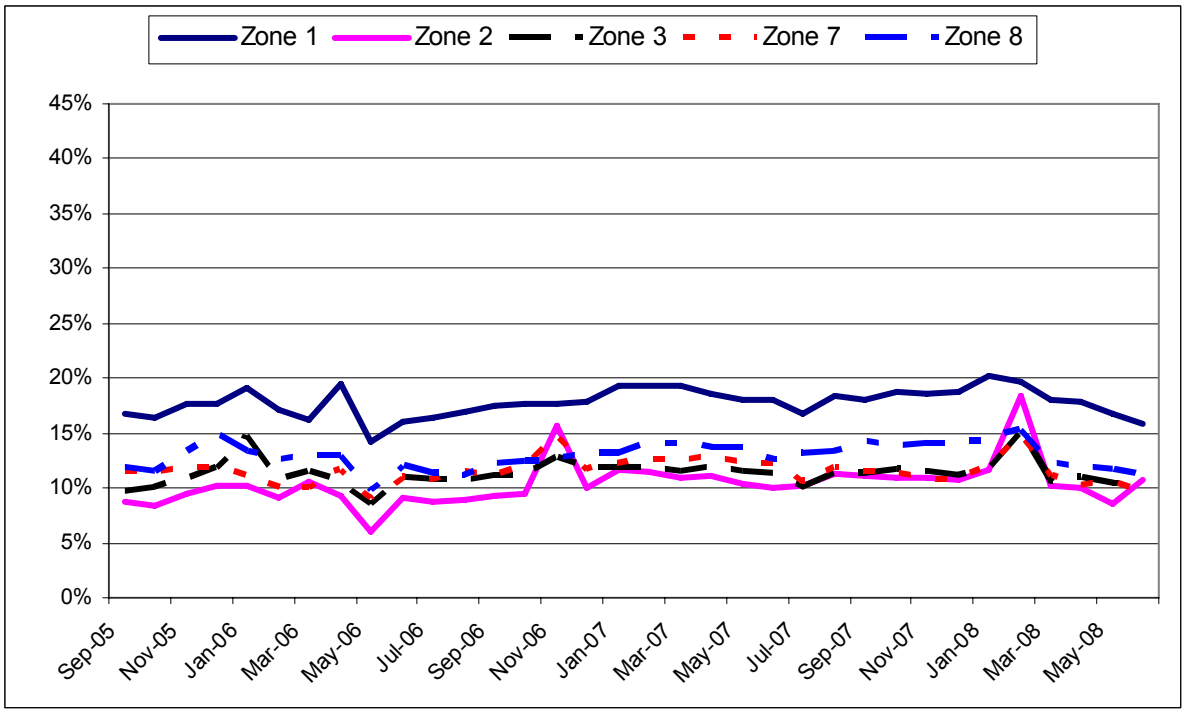
Exhibit 3.18 Hawaii Zone 1 DTW and Bulk Premium/Regular Spreads

Source: PUC Transaction database; July 2006 and June 2007 data not available

One other possible rationale for the higher prices is shown in Exhibit 3.19 and Exhibit 3.20 below. These exhibits show that the percentage of premium and midgrade sales in zones 1, 2, 3, 7 and 8 did not decrease despite the increase in premium and midgrade price versus regular gasoline after the gas caps were suspended. The fact that consumers did not initially reduce purchases of higher octane grades as DTW spreads increased may have prompted suppliers to push the margin higher.

This chart indicates that premium ratios in these zones did not really change until 2008 when overall petroleum prices significantly escalated from prior years.

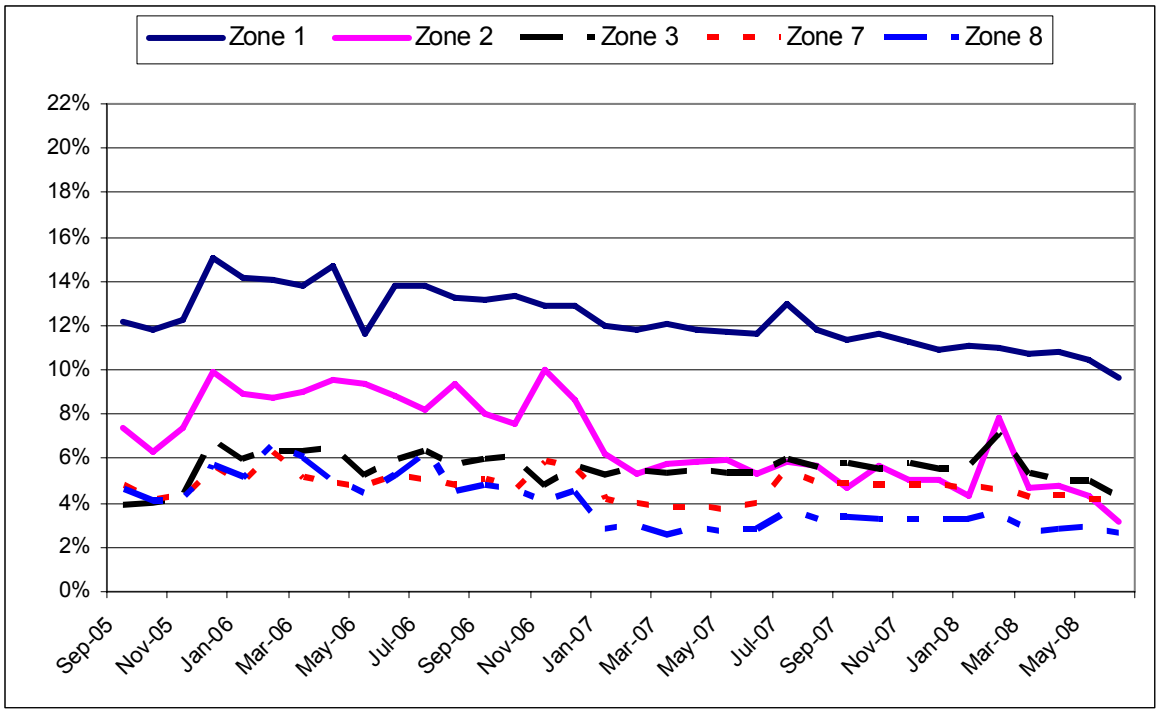
Exhibit 3.19 Percentage of Premium Gasoline Sales by Zone



Source: PUC Transaction Database

Unlike premium gasoline, midgrade sales in most zones show a slow and steady decline over the period. This may simply mean that consumers have not been seeing the benefit in paying higher prices for midgrade gasoline in Hawaii.

Exhibit 3.20 Percentage of Midgrade Gasoline Sales by Zone



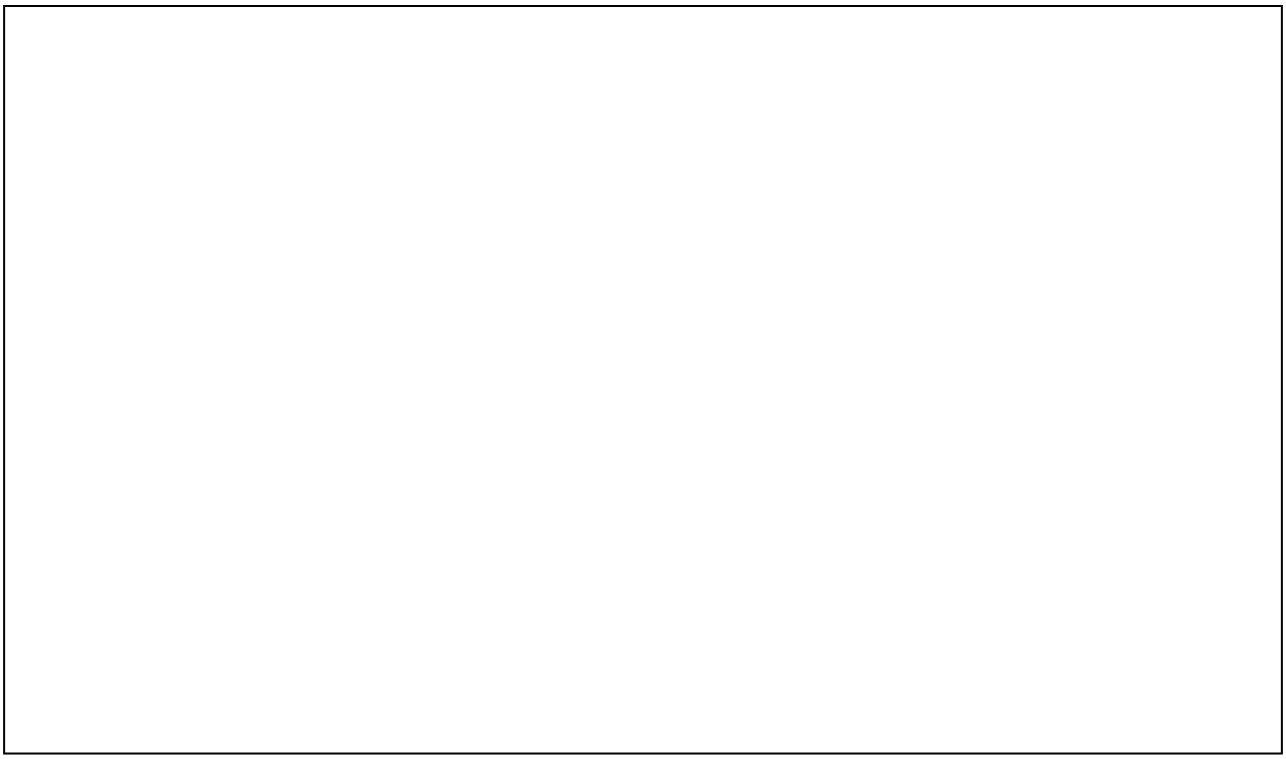
Source: PUC Transaction Database

Finally, a comparison of the Hawaii premium to regular Zone 1 bulk spread was made to the Singapore and U.S. Gulf Coast spot market spreads (See Exhibit 3.21). The Singapore and Gulf Coast gasolines do not contain ethanol, and the U.S. Gulf Coast premium is a 93 octane (versus Hawaii 92 octane), but the relative trends should reflect the changes in the value of higher octane grades versus regular in the global market. The exhibit shows that Singapore spreads are relatively flat over the entire period, and that Gulf Coast spreads are higher than the Hawaii spreads, but generally follow the same pattern. The average bulk price spreads for premium gasoline from Hawaii refiners to suppliers therefore appears based on some combination of Gulf Coast and Singapore market prices. The Zone 1 Bulk prices reflect a considerable amount of volatility which seems almost exclusively related to the U.S. based pricing component. The actual bulk prices paid by suppliers over the entire period appear are clearly higher than the 9 cpg adjustment allowed in the original Gas Cap formula.

The Hawaii Bulk price spreads have averaged [redacted] in most of 2007 & 2008, close to the Gulf Coast and Singapore spot/bulk prices. The Hawaii bulk prices therefore are reflecting similar market premiums as in other regions. Purchasers of premium grade gasoline from the refiners in Hawaii are generally earning money by buying premium at bulk prices and selling the gasoline at DTW prices (as shown in Exhibit 3.18)[20].

[20] Note that the DTW sale price must be sufficiently high enough above the bulk premium price to cover the costs to transport the premium grade to the service station, since bulk prices are generally directly from the refinery.

Exhibit 3.21 Comparison of Bulk Price Spreads for Premium vs. Regular



Source: PUC Transaction Database and Platts

Hawaii Prices vs. the Gas Cap

The next exhibit examines the specific trends in gasoline price in Zone 1 over the study period. Exhibit 3.22 tracks five separate prices: Average retail price based on data provided by OPIS, the gas cap (actual gas cap through May 5, 2006, and calculated gas cap based on Decision and Order No. 22451 thereafter), and weighted average bulk, rack and DTW (service station) prices based on transaction data. It is important to note that the gas cap as determined by Decision and Order No. 22451 was to allow the refiner/suppliers to pass on the cost of the ethanol conversion, but was never formally implemented. It is shown here as a mechanism to see how the oil industry priced in comparison to how they may have been forced to price had the cap been sustained). The key takeaways from this exhibit are as follows:

- The gas cap was initially very volatile due to the hurricane impacts on the price formula.
- DTW and rack prices march in lockstep with the cap over the Gas Cap period and begin diverging from the revised gas cap calculation immediately following the suspension of the Cap. The divergence is minimal above and below the calculated gas cap for several months, and then begins to exceed the cap in October 2006 as the calculated gas cap declines sharply with lower U.S. gasoline prices. The trend thereafter is that DTW and rack prices approximate the gas cap calculation and then lag the gas cap as the gas cap

increases in spring 2007, resulting in DTW and rack prices well under the gas cap calculation.

- Bulk prices do not mirror the gas cap trend. The bulk price transactions are based on price mechanisms that are different than the Gas Cap formula determined by the Hawaii Legislature and adopted by the PUC. These commercial terms may change over time, but have been based on a mix of U.S. prices as well as gasoline prices in the Far East markets, as well as including location adjustments based on actual freight markets. At times, the bulk prices move in opposite directions to the changing gas cap, or do not change as the gas cap changes. This results in some volatility in the margins for suppliers who buy bulk and sell at rack or DTW prices. With the high prices in the U.S. during and after the Gas Cap period, it appears the suppliers' commercial terms enabled them to receive product at prices less than what the Gas Cap formula assumed, providing stronger margins[21]. In 2008 however, bulk prices at times have exceeded DTW prices due to the weak gasoline market in Hawaii.

- The spreads between the prices represent the margins for various transactions. These will be discussed in more detail in the margin section. Note that retail prices include federal, state and county taxes, as well as the GET tax.

Exhibit 3.22 Overview of Different Price Channels in Zone 1 over the Study Period

Sources: Gas Cap, Bulk, Rack & DTW- PUC Transaction Database; Retail- OPIS

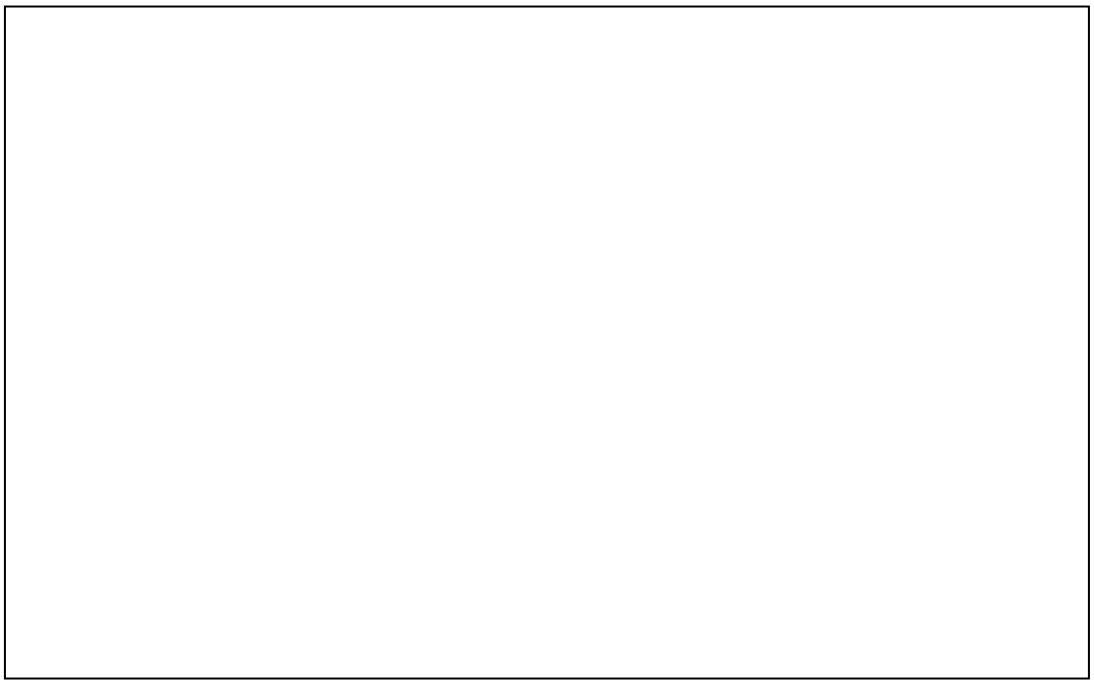
[21] Basically, this means that the Gas Cap "import parity" formula recommended by the Legislation (OPIS New York, Houston and Los Angeles prices plus a 4 cpg location differential) resulted in higher prices than the actual commercial terms between refiners and suppliers (which may have been based on Far East or other domestic markets). This essentially "gave" the suppliers higher margins if they priced at the gas cap since the Gas Cap formula was not in alignment with commercial terms. If Far East markets had been disrupted rather than the U.S., the supplier margins would have been drastically lower.

Sales to Service Stations

Exhibit 3.23 shows the gas cap and the DTW price to independently operated service stations in Zone 1 for all major suppliers. The exhibit indicates that all suppliers priced gasoline to service stations in Zone 1 during the Gas Cap period at the gas cap limit, with [redacted] Following suspension of the Cap, all companies followed the same DTW pricing pattern, with DTW prices exceeding the calculated gas cap limit during the market price decline, and then falling below the gas cap limit during the rising gasoline market in the spring. [redacted] The pricing variations could be related to the location of particular stations, a company's cost structure, or a marketing strategy.

Over the more recent period from January 2007 companies continued to follow a similar pattern with service station DTW pricing (i.e. [redacted] to price lower, for example). In addition, earlier data has shown that average DTW prices follow global markets; this chart shows that individual companies' pricing is competitive as prices rise and fall (it is competitive in that companies appear to modify their pricing to maintain a relative price point above or below other competitors).

Exhibit 3.23 Zone 1: Prices for DTW Service Stations and Gas Cap for Zone 1 by Supplier



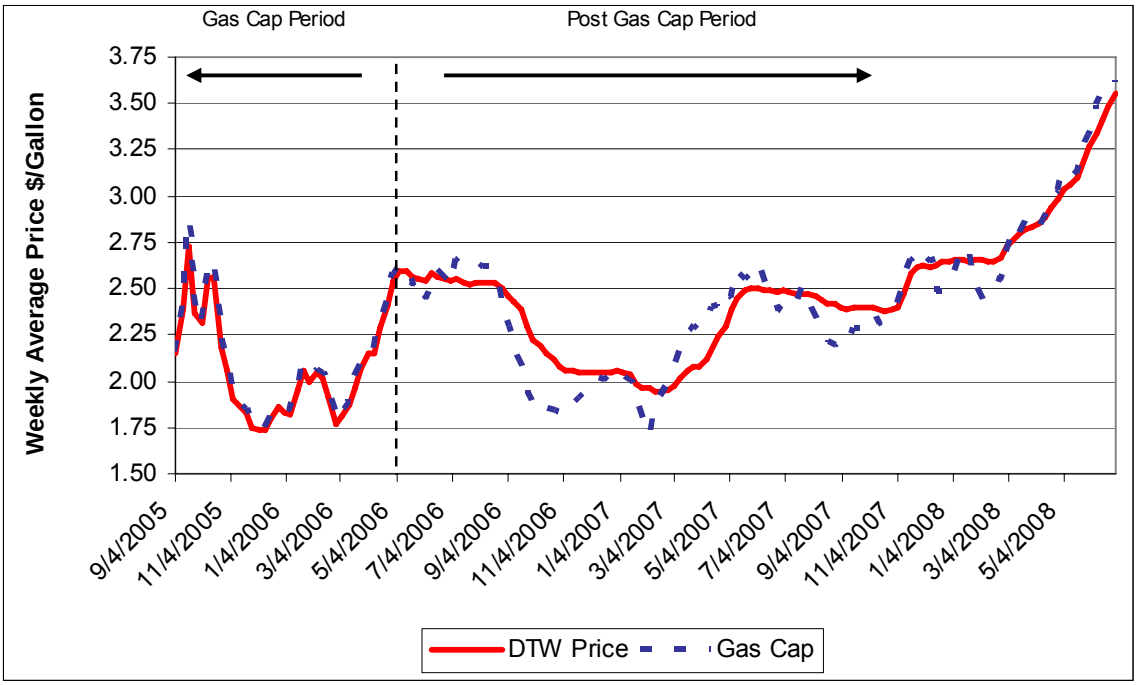
Source: PUC Transaction Database

Exhibit 3.24 is similar to Exhibit 3.23 but shows all the DTW sales in Zone 1 to service stations on a weight-averaged basis. The trend is identical to Exhibit 3.23, and depicts a market where DTW prices tracked the gas cap very closely during the Gas Cap period, and then varied following the Gas Cap suspension. The lag effect exists only after the Gas Cap was suspended, although it is important to note that the DTW prices are technically not lagging the gas cap

(which was not published), but are lagging the global prices in the U.S. and Far East markets. It also is clear that the DTW prices lag on the way up as well as the way down.

The chart from 2007 to current below shows that DTW price changes continue, for the most part, to lag changes in the calculated gas cap. Since the gas cap is not transparent to parties (i.e. published by the PUC), the fact that the lag exists is more reflective of the fact that the gas cap calculation changes promptly when global markets change, and the parties in Hawaii do not react as quickly to change DTW prices.

Exhibit 3.24 Average DTW Prices to Service Stations and Gas Cap in Zone 1



Source: PUC Transaction Database

Exhibit 3.25 shows in tabular format the specifics of the DTW service station price versus the gas cap in each zone on an average basis during and after the Gas Cap period. The period is divided into 4 distinct timeframes: 1) the Gas Cap period (September 2005 through April 2006); 2) 2006 Post Gas Cap Period (May 2006 through December 2006); 3) Full year 2007 and 4) 2008 year to date. All grades of gasoline are shown. On average, the parties selling gasoline during the Gas Cap period kept DTW prices under the cap by several cents per gallon (cpg). Following the Gas Cap period in 2006, prices tended to increase above the revised gas cap calculation, primarily due to the extended decline in gasoline prices in the fall of 2006, where the revised gas cap declined faster than the DTW prices. This resulted in several months where DTW price exceeded the revised gas cap and affected the average in all zones over the period.

Following this period, global prices began an extended rise through mid 2008. This gradually rising market would tend to result in DTW prices lagging the global market price rise and therefore appearing below or at the calculated gas cap. While not in the current study period, the very recent (Fall 2008) collapse in global prices is likely showing DTW prices above the calculated gas cap due to the price lag.

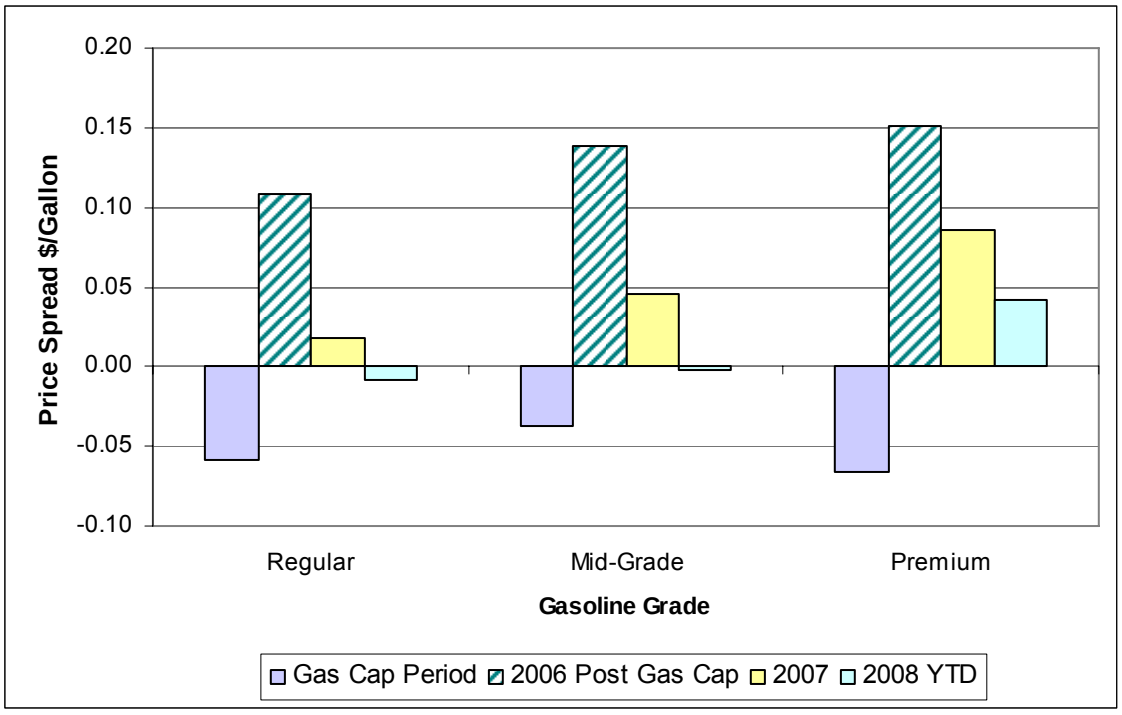
Exhibit 3.25 Average Price Spread between DTW Price to Service Station and Price Cap for Different Grades of Gasoline in Each Zone

Gasoline Grade	Period	Oahu	Kauai	Maui excluding Hana	Hana	Molokai	Lanai	Puna, South & North Hilo, and Hamakua	South & North Kohala, South & North Kona and Kau
		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Regular	Gas Cap	-0.07	-0.04	-0.05				-0.06	-0.07
	2006 Post Gas Cap	0.09	0.17	0.11				0.12	0.08
	2007	0.01	0.02	0.04				0.01	-0.01
	2008 YTD	-0.01	0.01	0.02				-0.04	-0.05
Mid-grade	Gas Cap	-0.04	0.00	-0.03				-0.02	-0.05
	2006 Post Gas Cap	0.13	0.15	0.13				0.18	0.12
	2007	0.04	0.03	0.08				0.02	0.06
	2008 YTD	0.01	-0.02	0.01				-0.08	-0.05
Premium	Gas Cap	-0.07	-0.02	-0.06				-0.07	-0.07
	2006 Post Gas Cap	0.15	0.20	0.16				0.16	0.11
	2007	0.08	0.10	0.11				0.08	0.05
	2008 YTD	0.04	0.04	0.09				0.00	-0.02

Source: PUC Transaction Database

It is also noteworthy that there was a significantly larger increase in premium and midgrade prices from before to after the Gas Cap suspension. Exhibit 3.26 shows this effect more clearly. This indicates that wholesale suppliers and jobbers selling on a DTW basis appeared to position premium grade products (Premium and Midgrade) at higher price spreads above regular gasoline when price controls were removed. The data from during the Gas Cap period shows that marketers had the ability to increase premium product prices somewhat and still stay below the premium or midgrade gas cap, but that action was not taken until after the Gas Cap was suspended.

Exhibit 3.26 Average Price Spread Across all Zones Between DTW Sales Price to Retail Gas Stations and the Gas Cap for Different Grades of Gasoline

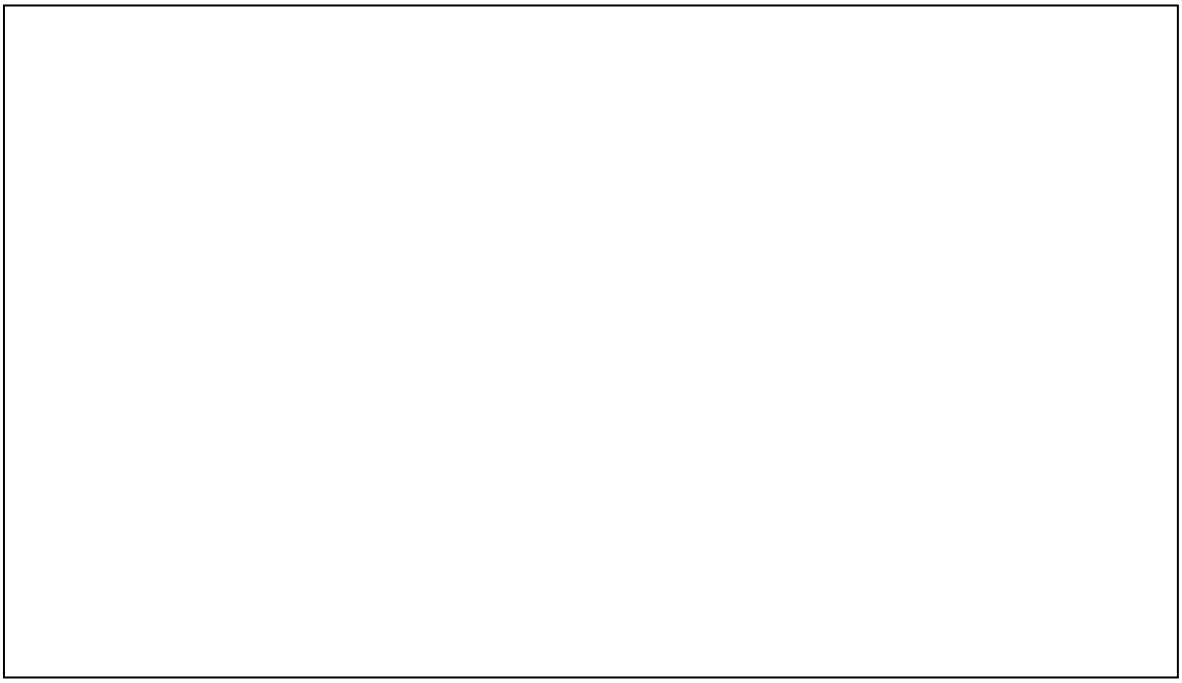


Source: PUC Transaction Database

Exhibit 3.27 and Exhibit 3.28 show the average DTW prices to service stations in Zones 6 and 5 for regular gasoline. These are shown separately since they are selling conventional gasoline, and also demonstrate a somewhat different pattern than other zones. The difference is primarily due to the step-wise movements in the DTW price following the Gas Cap suspension. During Gas Cap period, prices were set at or near the cap limit; following the suspension of the Cap, the DTW prices appear to mirror the acquisition price of the conventional gasoline on a barge basis. These purchases are less frequent and appear to indicate that the sellers are adjusting price when their acquisition price changes.

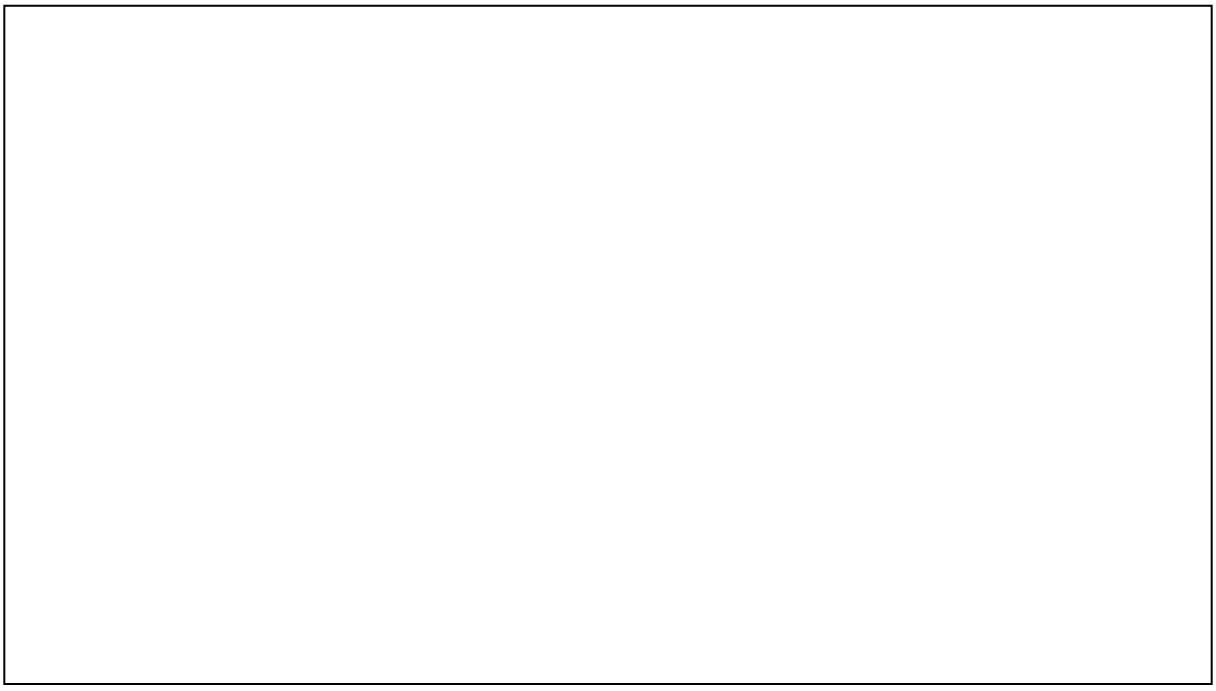
Zone 6 prices tend to lag market changes (and the calculated gas cap) more than other zones. This occurs in both rising & falling markets. The Zone 5 pricing trends show periods where prices are below the cap and periods where they are above; overall prices follow the calculated cap changes (i.e. global market changes). Both these Zones may be impacted by the fact that the parties marketing in Zone 6 and 5 only receive periodic fuel deliveries, and may tend to move prices in these zones directly based on the cost of periodic supply replenishment cost.

Exhibit 3.27 Average DTW Prices to Service stations and Gas Cap in Zone 6



Source: PUC Transaction Database

Exhibit 3.28 DTW Prices to Service stations by different Suppliers and Gas Cap in Zone 5

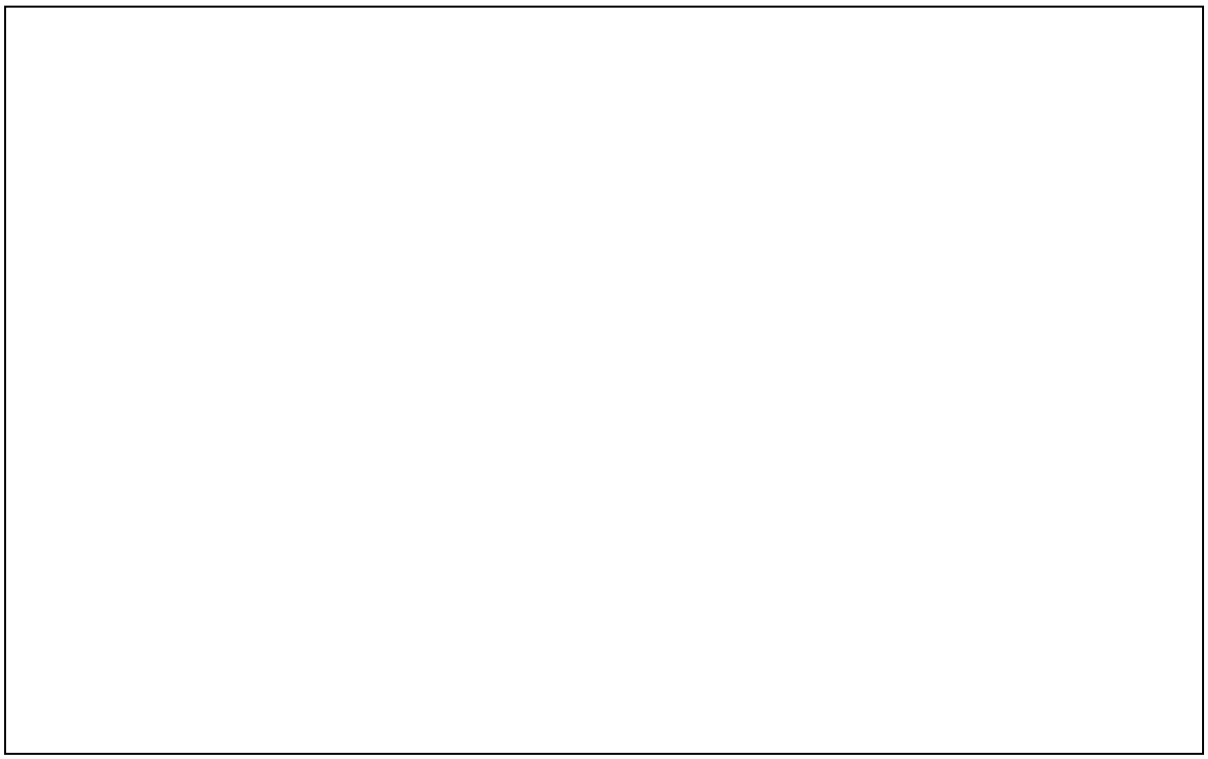


Source: PUC Transaction Database

Sales to Other DTW Customers

[redacted] Costco is able to purchase the gasoline at a discount to the normal service station DTW prices because they are normally receiving gasoline deliveries in large truck loads and because [redacted] does not have any costs associated with the operation, maintenance, property, etc after the gasoline is delivered to Costco. [redacted]

Exhibit 3.29 Average DTW Price to Costco in Zone 1 versus the Gas Cap

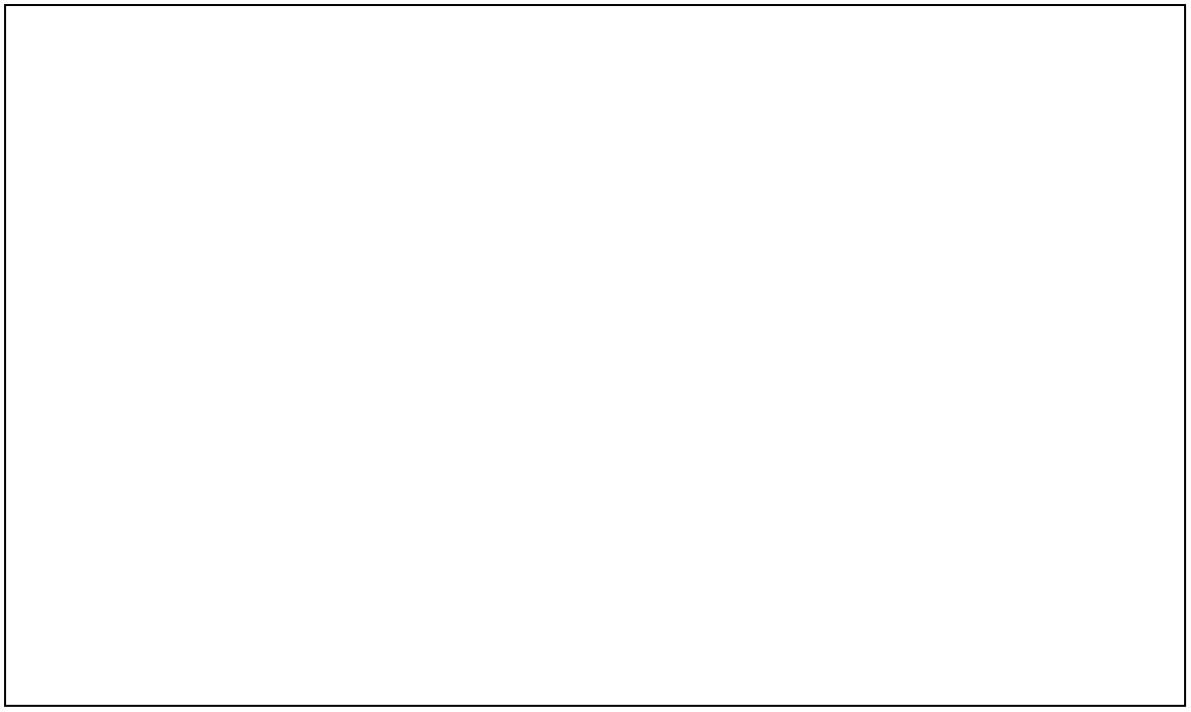


Source: PUC Transaction Database

Exhibit 3.30 shows sale prices of regular gasoline to the military in Zone 1. Similar to Costco, the military enjoys significant discounts to service station DTWs and has, in total, [redacted] Volume is delivered in large lots by [redacted] and there are no added costs at the military base which [redacted] would have with branded service stations.

The contract with the military appears to have a relatively consistent discount to the gas cap when the Gas Cap was in force, and that discount appears to be sustained after the Gas Cap calculation was revised. With the exception of the most recent datapoint, sales to the military have been at steeper discounts versus the calculated gas cap. This indicates that the military purchase contract is likely at a fixed discount versus one or more global marker prices (U.S. Gulf Coast, etc). Future reports may indicate whether the most recent datapoint is an anomaly or the result of a possible contractual change.

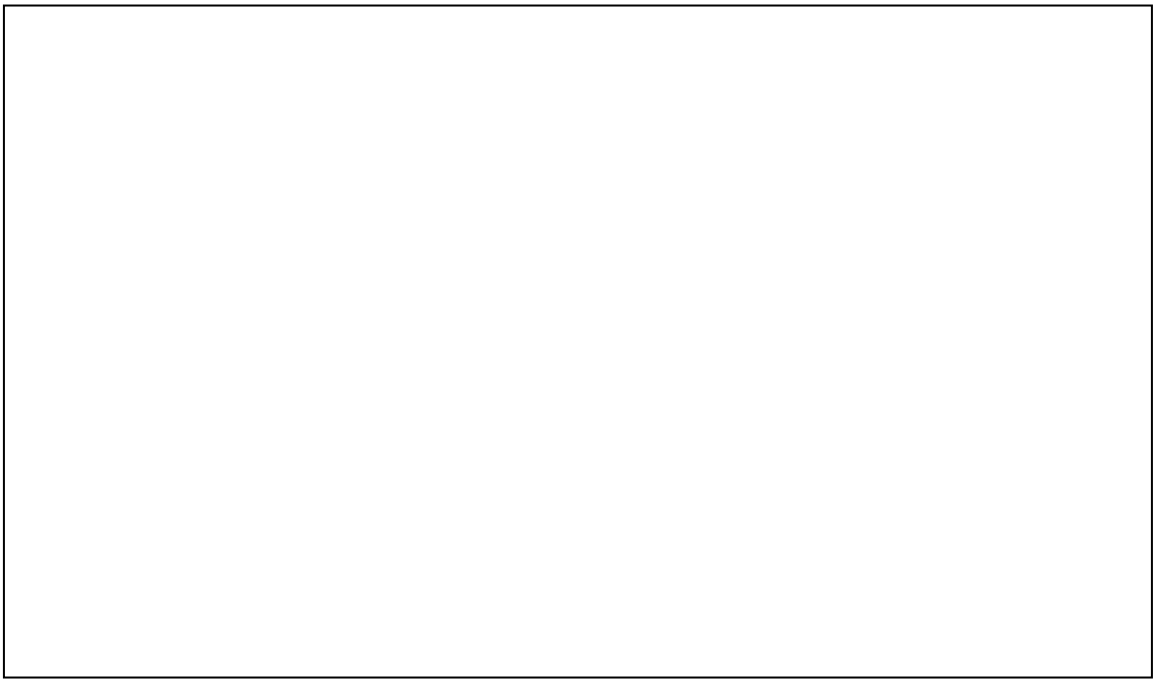
Exhibit 3.30 Average DTW Price to the Military in Zone 1



Source: PUC Transaction Database

Exhibit 3.31 shows the price trend in Zone 1 for DTW sales to car rental agencies. These volumes are significantly lower than those in the military or Costco channels, [redacted] Average transactions during the Gas Cap period were [redacted] below the gas cap in Zone 1. [redacted] In this case, average volumes are a key factor. Following the Gas Cap suspension, the rental car channel tended to price above the revised gas cap calculation for the period of time that markets were falling, and lagged the increases in the cap limit in 2007 and 2008. In general, the car rental companies continued to purchase product at a discount versus the calculated gas cap through mid 2008.

Exhibit 3.31 Average DTW Price to Car Rental Agencies in Zone 1



Source: PUC Transaction Database

Exhibit 3.32 shows the overall view of wholesale prices versus the Gas Cap both before and after the Gas Cap was suspended. The analysis is for regular gasoline in all zones to all channels of sales, including rack and bulk. The data show the magnitude of the discounts to Costco and the military, as well as the discounts to car rental companies. [redacted]

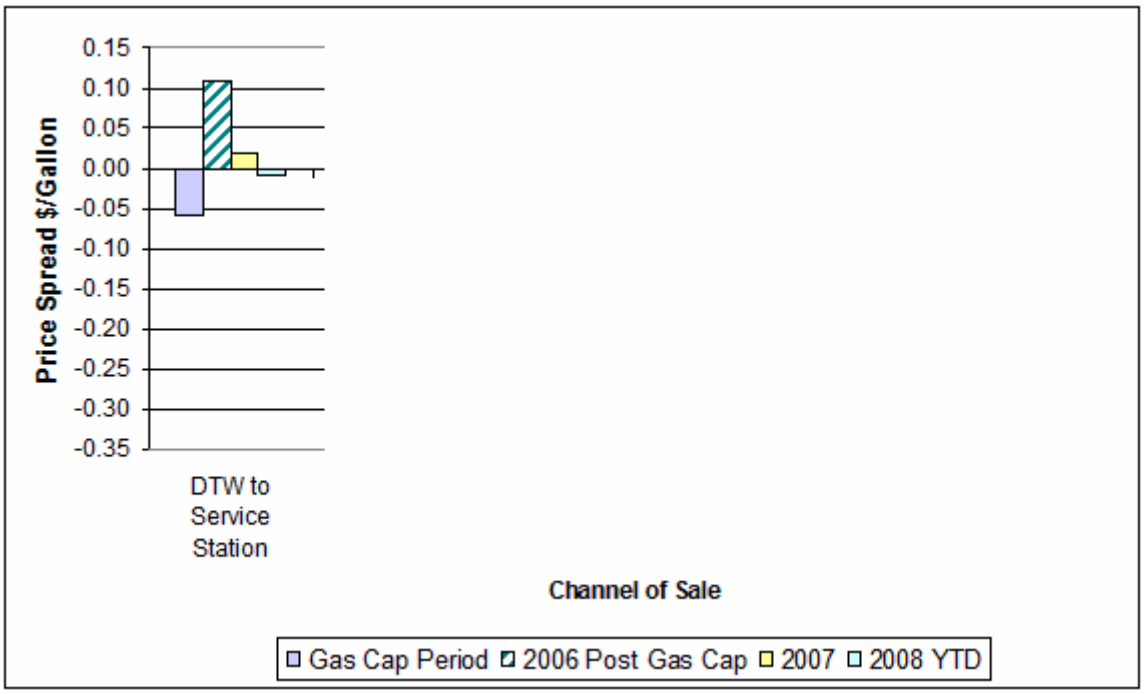
On average, this exhibit indicates that DTW sales to service stations were slightly under the Gas Cap while it was in force. It is clear that the suspension of the Gas Cap has resulted in prices to service stations averaging above the revised Gas Cap calculation, but the reason appears more related to the steep decline in prices in late 2006 than any apparent actions to raise prices at constant market prices. Subsequent to the price decline in 2007 and 2008, DTW prices to service stations were slightly above or below the gas cap calculation.

Price levels for Military sales were consistently well under the gas cap calculation.

[redacted]

Price levels for bulk and rack transactions were well below the actual and revised Gas Cap in both periods.

Exhibit 3.32 Average Price Spread across all Zones for different channels of sales and the Gas Cap



Source: PUC Transaction Database

Summary Conclusions: Comparison of Gasoline Prices to Gas Caps

The primary conclusions are as follows:

- Wholesale gasoline prices during the Gas Cap period (September 2005 to May 5, 2006) were maintained below the required ceiling for all channels of sales. DTW sales to retail service stations averaged about 6 cpg *below* the Gas Cap (state-wide), with many stations pricing within 3 cpg of the Gas Cap at all times.

- Wholesale prices to retail service stations during the Gas Cap period tended to directly track changes in the Gas Cap limit. In other words, DTW prices to service stations were being set by the allowable Gas Cap, not the competitive market.

- In the study period following the suspension of the Gas Cap (May 8, 2006 through June 29, 2008), DTW prices to service stations have ranged from about 5 cpg *above* the revised Gas Cap maximum price (Decision and Order No. 22451 formula to adjust for ethanol blending) to several cpg below the revised gas cap price. The DTW pricing tended to lag changes in overall market conditions after the Gas Cap was suspended (in both up and down markets).

- Changes in bulk prices to suppliers did not appear to influence the DTW prices charged to service stations. This may be because suppliers have minimal incentive to lower price when their cost changes, because a more competitive (lower) price versus competitors could increase sales, and the suppliers' access to product is limited from the refiner contracts. [redacted]. The weak gasoline market in Hawaii (lower demands) contributed to lower crude processing and inability of the refiners or suppliers to push prices higher.

- Suppliers and refiners increased DTW prices for midgrade and premium gasoline versus regular gasoline after the Gas Cap was suspended. The average DTW prices over the revised Gas Cap (per Exhibit 3.25) tended to be higher for the premium grades than unleaded regular following gas cap suspension. The higher premiums for the higher octane grades have dissipated somewhat in 2008. The allowable premium adjustment factor under the Gas Cap formula (9 cpg) appeared to often be below the actual market cost paid by suppliers under commercial terms.

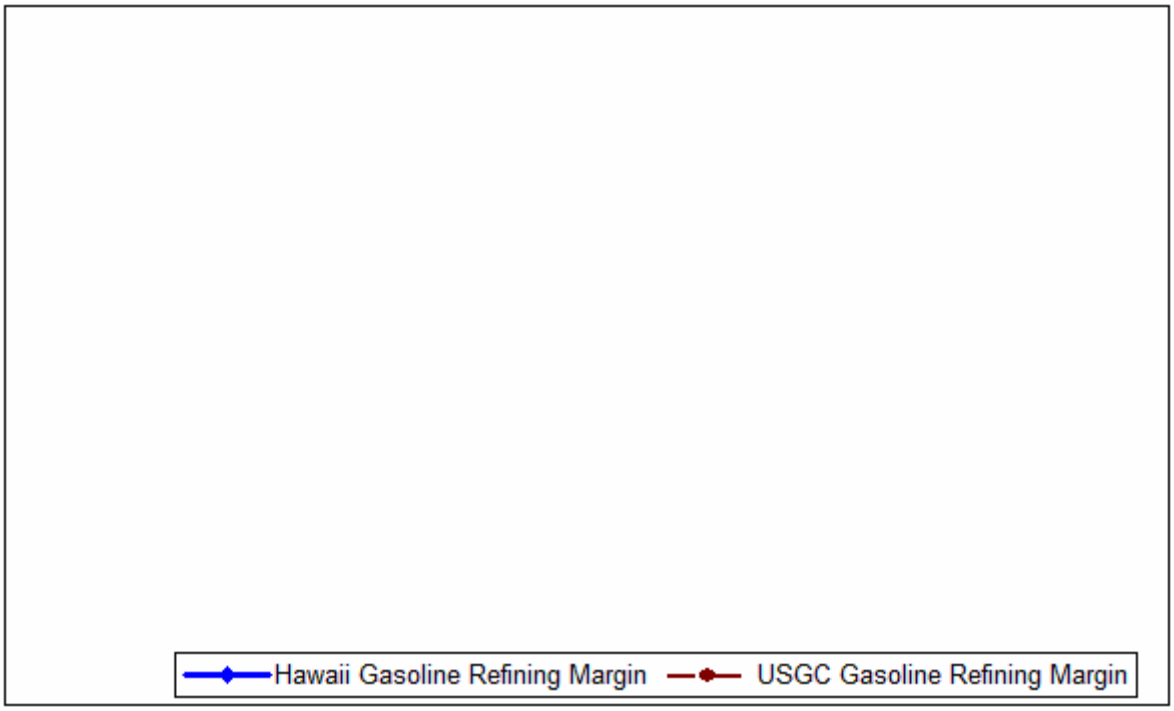
Refiner Gasoline Margins

Exhibit 3.33 identifies the margin between crude oil cost and gasoline sales at the refinery level for both Hawaii and the U.S. Gulf Coast. In the Gulf Coast, spot market gasoline margins averaged about $0.40-0.46/gallon above crude cost[22] through January 2008 and then fell to just above $0.30/gallon in the first half of 2008. Hawaii bulk gasoline sales directly from refiners [redacted] also fell in the first half of 2008, but not as steeply as the U.S. Gulf Coast refiners. Overall this means that bulk gasoline prices from Hawaii refiners are providing less of an overall profit contribution to the Hawaii refiners than Gulf Coast refiners enjoy.

The narrowing of this gap in 2008 may stem from the fact that Hawaii refiners appear to be processing a lower cost crude mix in 2008 than in prior years.

[22] U.S. refining margin is calculated by subtracting US RAC Crude price from USGC 87 Reg Unl Price. Hawaii Refining Margin is calculated by subtracting Hawaii landed crude price from Hawaii bulk gasoline price for Zone 1.

Exhibit 3.33 Gasoline Refining Margins for US Gulf Coast and Hawaii

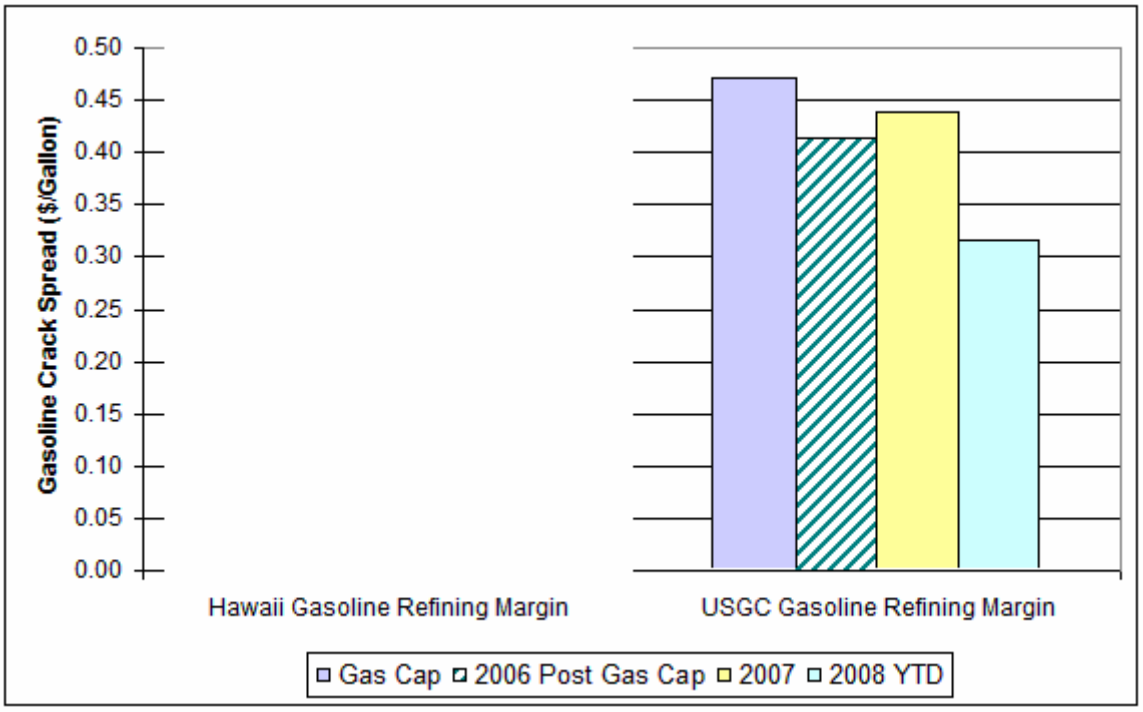


Sources: Hawaii- IPIR, PIMAR, & PUC Transaction Database; USGC- EIA

Exhibit 3.34 shows the same data in column format. Actual Hawaii refiner gasoline margin improved somewhat after the Gas Cap was suspended due to the fact that declines in gasoline price in the U.S. Gulf Coast in the fall of 2006 were greater than the decline in other markets such as Singapore. Since Singapore and other Far East markets can be components of refiner bulk pricing terms with suppliers, this would mean that the Hawaii refiner could see an improvement in margin versus a Gulf Coast refiner.

Overall, the Hawaii refiner gasoline margins (bulk vs. crude cost) are generally lower than the USGC. This reflects Hawaii's much higher crude cost and somewhat higher bulk gasoline price vs. the USGC, resulting in a lower net margin.

Exhibit 3.34 Refining Margin Comparison by Gas Cap Period: U.S. Gulf Coast and Hawaii



Sources: Hawaii- IPIR & PUC Transaction Database; USGC- EIA

Supplier and Jobber Margins

The transaction data provided to the PUC by suppliers and jobbers beginning in September 2005 and continuing through the new PIMAR reporting process enable a determination to be made of both supplier and jobber gross margins[23]. These margins are simply the average price for product sold less the cost of product acquired. Suppliers have costs which are not reflected in the gross margin. The costs would vary depending on a supplier's assets. Suppliers who have terminals, marine equipment, truck fleets, own service stations or lease branded stations, etc., may have more costs than a supplier or jobber who simply owns trucks and loads and delivers product to customers.

The Gas Cap legislation provided a maximum gasoline price which included an 18 cpg marketing margin as well as a zone adjustment factor. The zone adjustment factor reflects the cost of moving product to each zone, and for truck delivery costs as reported by the supplier or jobber with the highest delivery cost. This allowed jobbers servicing remote independent dealers to recoup the high trucking cost to deliver to those locations. An example gas cap buildup is shown in Exhibit 3.35 for Zone 1 for the Gas Cap period (pre-ethanol period): This therefore assumed a supplier or jobber could have a gross margin of about 24.5 cpg in Zone 1 to cover their marketing and distribution costs as supplier, if they priced their gasoline at the gas cap. It is

[23] Suppliers are defined as non-refiners who purchase gasoline in bulk or large volume quantities from refiners, and who re-sell the product to jobbers or DTW channels. Jobbers are smaller companies who buy product from refiners or suppliers usually at rack prices, and resell to primarily independent service stations or commercial accounts on a DTW basis.

also contingent on the supplier's actual bulk acquisition price being consistent with the PUC's import calculation.

Exhibit 3.35 Determination of Allowable Gross Margins during the Gas Cap Period, $/gallon

	Zone 1
Avg. OPIS Prices, NY, LA, GC	2.20
Location Diff	0.04
Import Parity	2.24
Marketing margin	0.18
Zone Adjustment	0.065
"Allowable Gross Margin"	0.245
Calculated Gas Cap	2.485

Source: PUC Gas Cap Calculation file

Supplier Margins

The exhibits shown in this presentation and discussion of supplier margins often indicate either spikes in margin, or extended periods of margins greater than the 24.5 cpg that was in the structured Gas Cap calculation. It is essential for the reader to recognize that under all periods when the gas caps were in place, the actual DTW prices that were charged to service stations or other channels were, with rare exceptions, always at or under the gas cap limit. The higher margins were almost always the result of actual commercial transaction terms between suppliers and the refiners which resulted in supplier acquisition prices that were under the calculated Gas Cap import parity.

The supplier margins are presented individually at first, and then aggregated. Please note that during the period with E-10 in the market (after April 2006) the supplier margins are often directly comparing the DTW price of E-10 to purchased E-10 under bulk price terms. In some cases the supplier is purchasing HIBOB gasoline blendstock and ethanol under bulk terms, and then blending the product themselves. For these situations it was necessary to assume that the ethanol price paid by the supplier was the price computed for the Gas Cap calculation process. The net ethanol price (ethanol price less 51 cpg ethanol tax credit for blenders) was used to determine the supplier's gasoline price for margin calculations.[24]

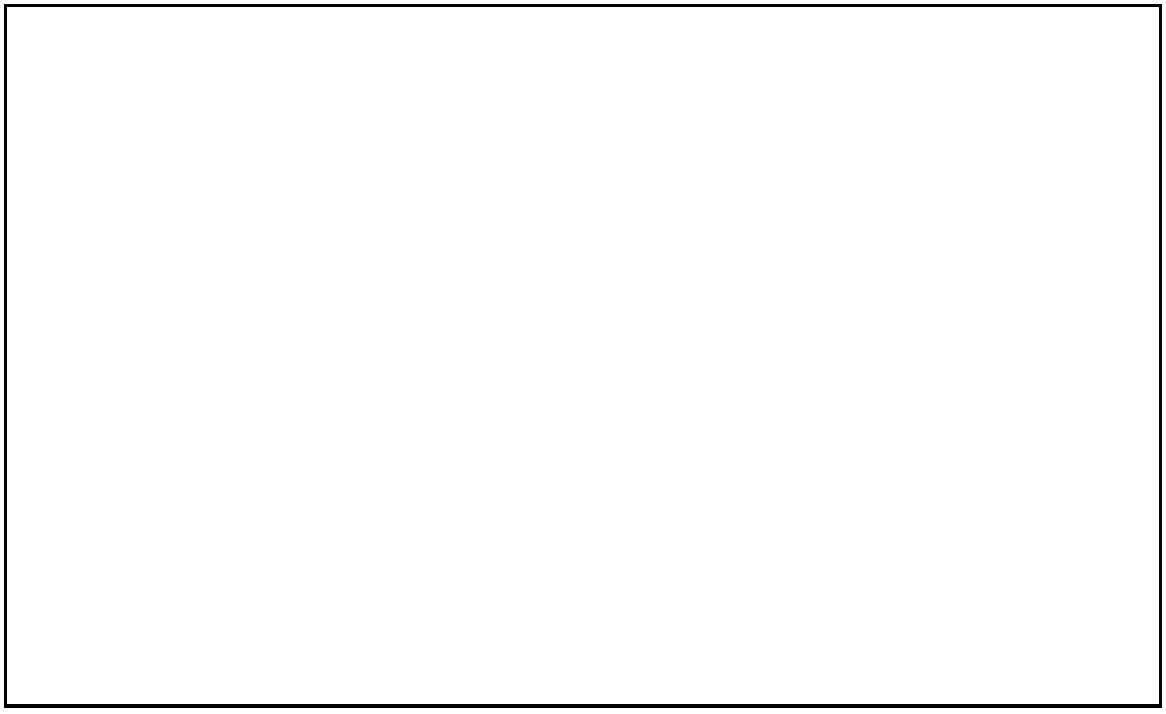
It should also be noted that Suppliers report weekly gross margins to the PUC on the W-150 report. These weekly reports are filed for each zone and contain good information. However, they aggregate volumes and prices from different channels (service station sales, car rental sales, military and Costco sales. The comparisons below focus on the individual sales channel margins, using PIMAR data from the gasoline transaction database.

[24] Purchase price equals HIBOB acquisition price times 90% plus (PUC calculated ethanol price (basis U.S. East Coast, Chicago, and Los Angeles ethanol average) minus 51 cpg blending credit) times 10%.

Aloha

[redacted]

Exhibit 3.36 Aloha Supplier Margins by Channel of Sales in Zone 1



Source: PUC Transaction Database

[redacted]

Exhibit 3.37 Aloha Supplier Margins on a Weekly Basis

Source: PUC Transaction Database

[redacted]

[redacted]

[redacted]

Exhibit 3.38 Aloha Supplier Margins, Zones 7 and 8

Source: PUC Transaction Database

[redacted]

Exhibit 3.39 Mid-Pac Supplier Margins by Channel of Sales

Source: PUC Transaction Database

[redacted]

[redacted]

Exhibit 3.40 Mid-Pac Supplier Margins on a Weekly Basis

Source: PUC Transaction Database

Shell

[redacted]

[redacted]

Exhibit 3.41 Shell Supplier Margins by Zone, $/gallon Gross Margin

Source: PUC Transaction Database

[redacted]

Exhibit 3.42 Shell Margins on a Weekly Basis, Zones 3 and 7

Source: PUC Transaction Database

Exhibit 3.43 Shell Margins on a Weekly Basis, Zones 1 and 2

Source: PUC Transaction Database

Supplier Comparative Pricing

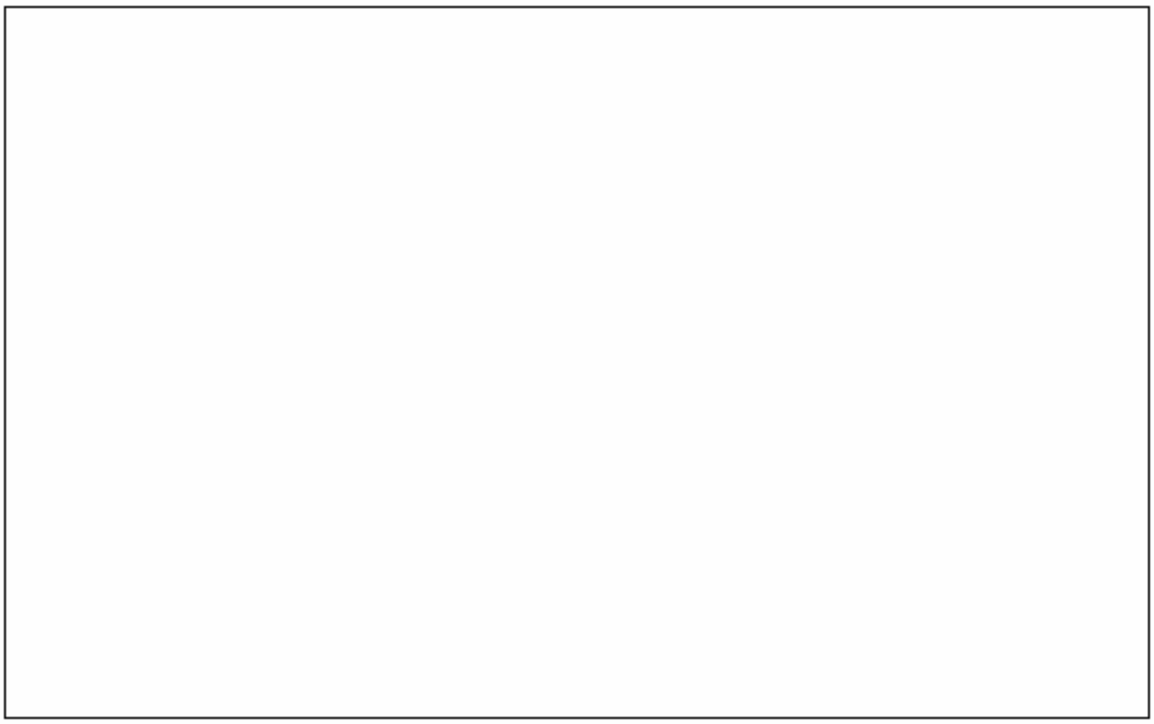
[redacted]

[redacted]

Exhibit 3.44 Comparison of Supplier Acquisition Costs of Gasoline on Bulk Basis in Zone 1

Source: PUC Transaction Database

Exhibit 3.45 Comparison of Supplier DTW Sales Prices to Service Stations in Zone 1



Source: PUC Transaction Database

Jobber Margins

Jobbers' margins are determined from their product revenue (selling at a DTW price typically) less acquisition price from their suppliers, which is typically a rack price delivered into the jobber's truck at a terminal. The jobbers' primary business costs involve transportation of product to their customers, maintenance and business expenses, labor, insurance, and so on.

Exhibit 3.46 shows the calculated jobber margins by individual jobber and zone for regular gasoline. Jobber margins range from a low of $0.05/gallon to a high of $0.15/gallon during the Gas Cap period. In most cases, after the Gas Cap was suspended the jobbers increased their margins by raising prices to their customers relative to their cost of supply.

Jobber margins have remained well above the margins during the gas cap period for almost all jobbers. The margins presented below are in most cases the sole revenue stream that a jobber has to run their business and earn profits[25].

25 [redacted]

Exhibit 3.46 Jobber Margins by Company and Zone

Source: PUC Transaction Database, IPIR & PIMAR

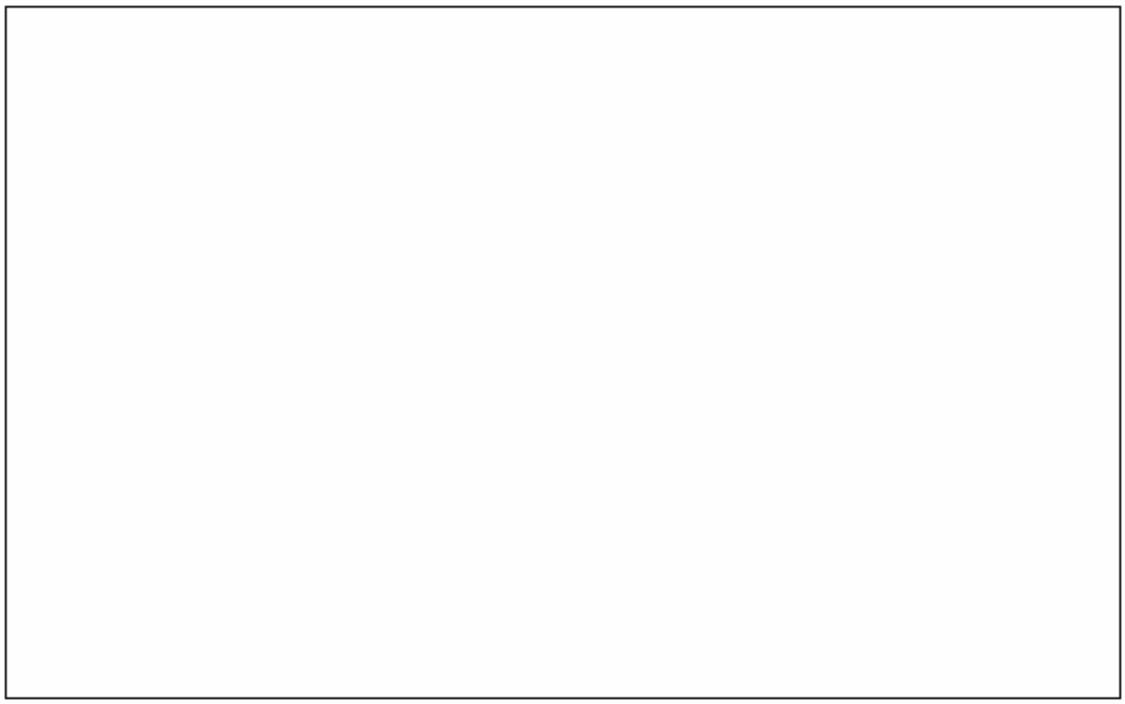
Exhibit 3.47 shows trends in jobber margins in Zone 5 and 6, where conventional grade gasoline is sold. These margins show in fact lower margins after the gas caps were suspended, potentially implying that zone adjustments for these locations may have been higher than necessary.

Exhibit 3.47 Jobber Margins, Island Petroleum and Lanai Oil

Source: PUC Transaction Database

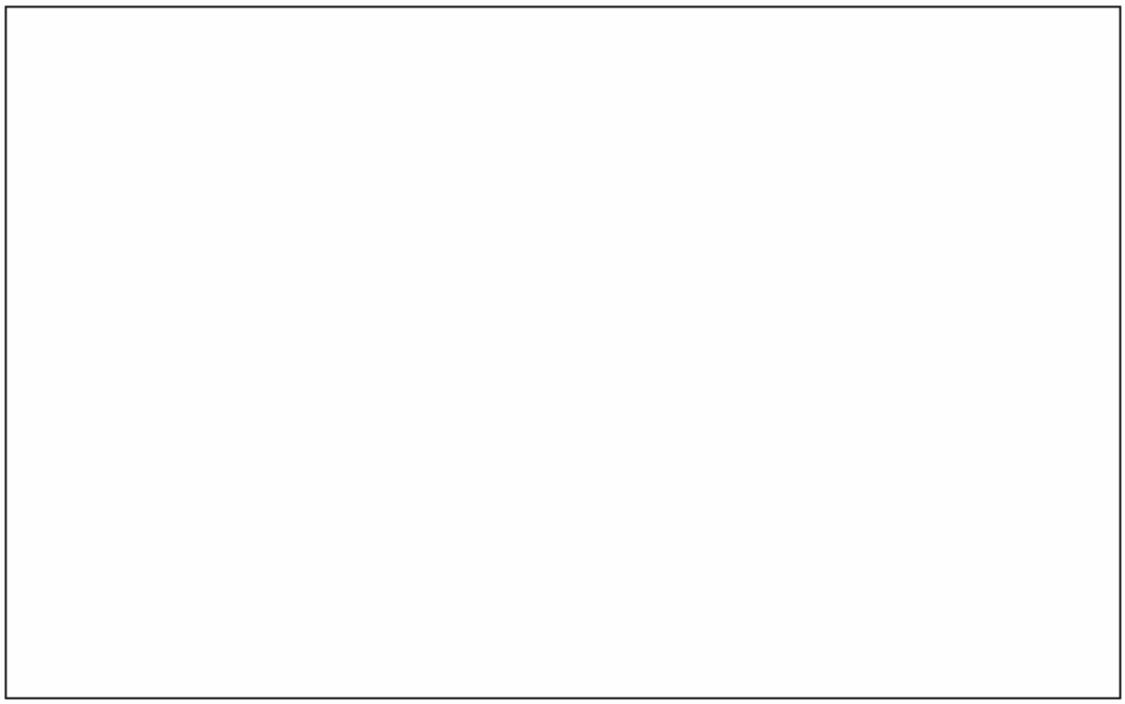
[redacted]

Exhibit 3.48 Jobber Margins, Zones 1 and 2



Source: PUC Transaction Database, IPIR & PIMAR

Exhibit 3.49 Jobber Margins, Zone 3



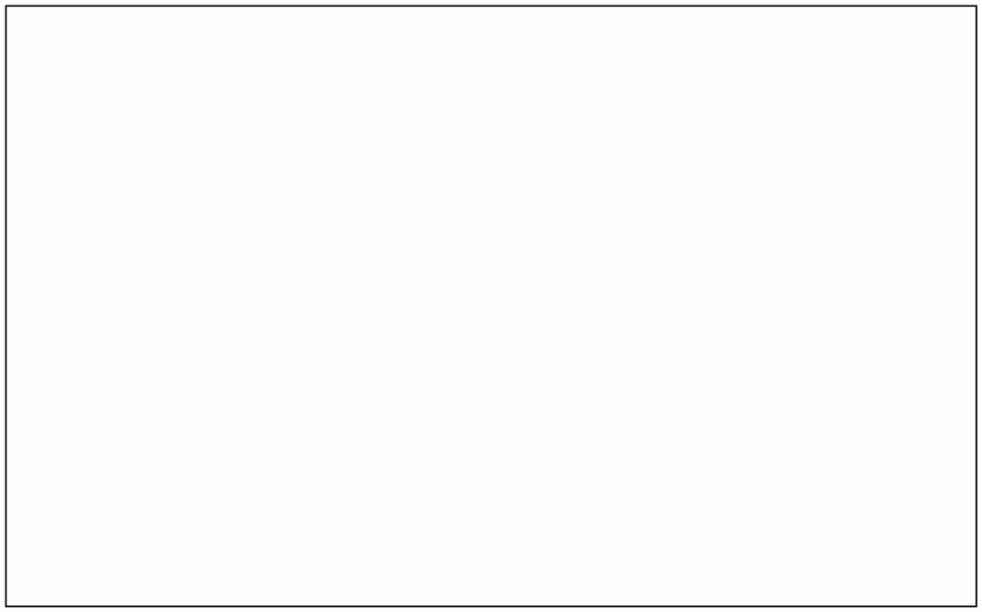
Source: PUC Transaction Database

Exhibit 3.50 Jobber Margins, Zones 7 and 8

Source: PUC Transaction Database

Exhibit 3.51 shows margins for premium gasoline over unleaded for a number of jobbers in different zones. The chart indicates that, similar to suppliers, the jobbers increased premium margins after the gas caps were suspended[26].

Exhibit 3.51 Jobber Margins, Premium



Source: PUC Transaction Database

Supplier and Jobber Margin Summary

Overall, supplier and jobber DTW prices during the Gas Cap period were controlled as intended in the legislation. Margins earned by suppliers benefited from lower acquisition costs from refiners based on purchase terms that were on a different basis than the Gas Cap calculation. Both suppliers and jobbers changed their prices as the Gas Cap changed.

Supplier margins to service stations show in most cases the highest margins existed in 2006 following the suspension of the gas caps as global petroleum prices declined significantly. Margins were also good during the gas cap period. In 2007 and most notably in 2008 supplier margins to service stations declined. The decline in 2008 is driven by a weak gasoline market in Hawaii which has kept DTW price increases well below increased global market price increases. Since global market price increases are the basis for supplier's acquisition costs from refiners, their margins have clearly been squeezed in 2008. Jobber margins overall were relatively consistent from one period to another, with some jobbers showing higher margins than others.

The analysis of margins for suppliers and jobbers in this report represents the best understanding of the data as reported to the PUC in the transaction database and the PIMAR reports filed by the parties. Each party's individual business may require more or less cost than others to achieve the gross margins presented in this report, and hence the reader must use

26 [redacted]

discretion in extrapolating absolute gross margin numbers into conclusions on absolute profits. The value of the Monitoring Program is to initiate a tracking process to identify the margins and follow them over time to provide a greater transparency to the overall level and trends of the margins.

Retail Service Station Margins

The reporting mechanism established by the PUC in 2005 collected all transactions between refiners, suppliers and jobbers with buyers and sellers identified. These transactions included all transactions of sales of gasoline to service stations in Hawaii. The DTW transactions from refiners, suppliers and jobbers to service stations provided transparency to the actual cost of gasoline to all service stations in Hawaii except the company owned and operated stations (these stations were not included in the Gas Cap process because there was no wholesale transaction in the delivery chain to those stations).

Therefore, the “purchase” cost for a number of service stations is known. The actual retail prices (or “street” prices visible to consumers) for a number of Hawaii service stations in Zones 1, 2, 3, 5, 7 and 8 were obtained by the PUC from the Oil Price Information Service (OPIS), which tracked and reported daily “street” prices, including taxes, for over 140 service stations in Hawaii. These stations include about 35 service stations which were also included in the PUC transaction database.

Access to this information enabled a determination to be made of the retail service station margins in Hawaii by several different methods. The determination must first adjust the retail prices in each zone for the applicable taxes. Exhibit 3.52 below shows the tax assumptions in each zone used to determine the net (after tax) retail price in each zone and for each applicable time period.

Exhibit 3.52 Tax Assumptions Used to determine Net Service Station Retail Price

		Date (if applicable)	City and County of Honolulu	County of Maui	County of Hawaii	County of Kauai
Fixed fuel taxes (per gallon)						
Federal			$0.184			
State-level	Hawaii Fuel Tax	Before Jul 1, 2007	$0.16			
		Beginning Jul 1, 2007	$0.17			
	Environmental Response Tax		$0.00119			
County-level		Before Jul 1, 2006	$0.165	$0.18	$0.088	$0.13
		Beginning Jul 1, 2006		$0.16		
Percentage sales taxes						
State-level	General Excise Tax	Before Apr 1, 2006	4%			
		Apr 1–Dec 31, 2006	0%*			
		Jan 1–Jun 30, 2007	4%			
		Beginning Jul 1, 2007	0%*			
County-level	County Surcharge Tax	Jan 1–Jun 30, 2007	0.5%			

* Except Zones 5 and 6, where the GET remains effective at 4%; E-10 gasoline was not adopted in Molokai and Lanai so the exemption does not apply.

Example:
Total taxes on a gallon of gasoline that retailed for $3.509 on the island of Maui on Apr 19, 2007 can be computed as follows:
Fixed tax total = 0.184 + 0.16 + 0.00119 + 0.16 = 0.505
Taxable amount = 3.509 − 0.505 = 3.004; Sales tax total = 4% × 3.004 = 0.120
Total taxes = 0.505 + 0.120 = 0.625

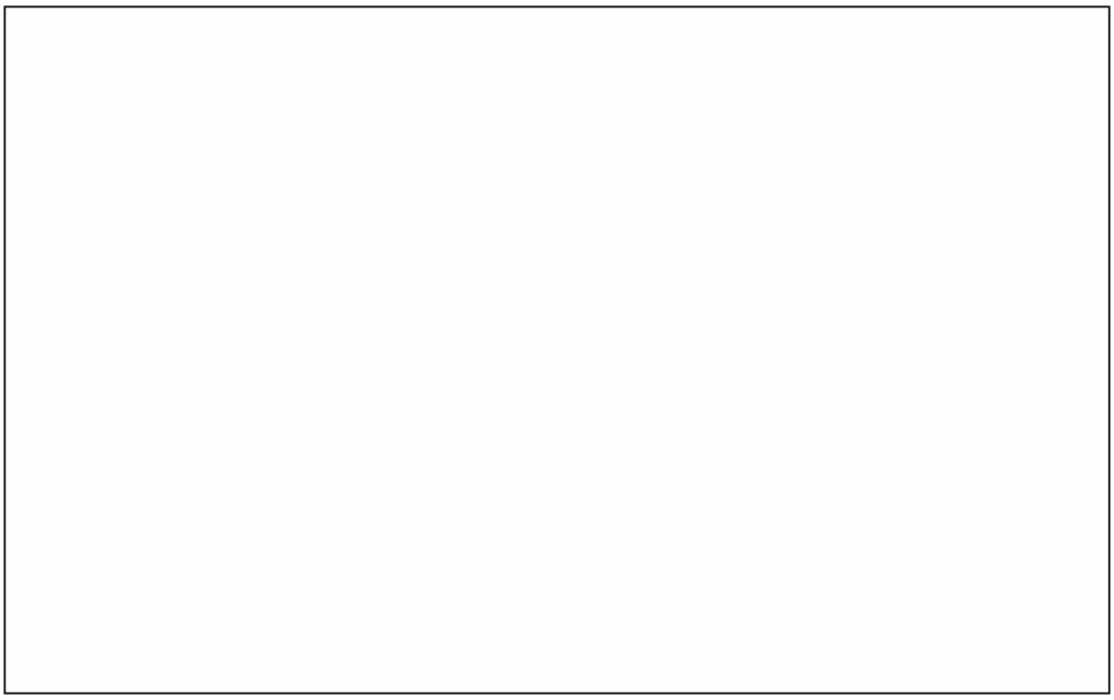
Sources: State tax increase 16 cents to 17 cents- Hawaii Senate Bill 1285; Maui County tax decrease 18 cents to 16 cents (Maui County Resolution 06-44)- Department of Taxation Announcement No. 2006-08; Federal Fuel Tax- EIA; Honolulu County Surcharge Tax- Department of Taxation Announcement No. 2006-15
The adjustments reflected changes in the Maui County tax in 2006, the GET tax increase for Honolulu County in 2007, and the varying application of the GET tax in all counties selling gasoline with 10% ethanol. The GET tax was exempted in 2006 when ethanol blending was initiated, but then was applicable as of January 1, 2007 when the Legislature did not extend the exemption. The exemption was reinstated on July 1, 2007.

The first retail margin calculation method involved comparing the daily OPIS average retail price in each zone (netted for taxes) with the daily average DTW price from all refiners, suppliers and jobbers in each zone. This graph is shown on Exhibit 3.53 below. The exhibit is very busy and contains data for all zones except Zones 4 and 6. However, the intent in showing this exhibit is to demonstrate that despite some volatility in the daily pricing and occasional spikes up and down, the underlying range of retail margins in Hawaii appears to vary from about $0.15/gallon, or 15 cpg up to $0.50/gallon, or 50 cpg. These margins are different for each zone, although in general it appears the retail margins increased immediately after the Gas Cap was suspended, and then began declining somewhat in late 2006.

Margins from mid-2007 tended to be stable until June 2008 when margins appear to have increased. It is possible retailers began increasing street prices to gain higher margins to compensate for lower sales volumes due to higher prices or less tourism volume.

The relative retail margins between zones show Zone 1 with the lowest margins. Zones 3 and Zone 8 have much higher margins than the other higher volume zones.

Exhibit 3.53 Service Station Net Margin by Zone



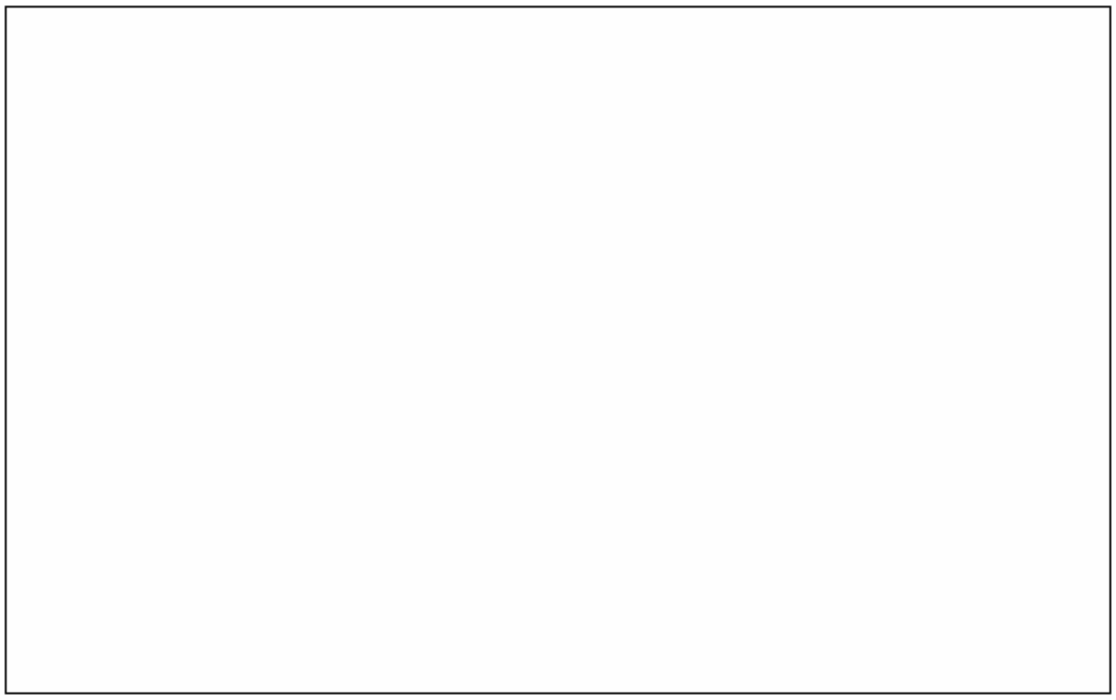
Source: OPIS and PUC Transactions Database

Exhibit 3.54 shows the same data on an overall average basis during and after the Gas Cap period by zone. The data indicate that margins did, on average increase after the Gas Cap was suspended, even though the retail margins were never impacted by the Gas Cap legislation.

In addition, the retail margins in Zone 1 (Oahu) averaged about $0.20/gallon and were not materially different during and after the Gas Cap period. Margins in other zones, however, were significantly higher than margins in Oahu during both periods. As shown in Exhibit 2.4, Zone 1 has the highest number of gas stations to serve the highest gasoline consumption among all zones. Service stations in Zones 1, 2, 3 and 7 have average gasoline sales that are close to, or higher than the U.S. average throughput. The stations in Zones 4, 5, 6 and 8 have much lower throughputs and therefore may need higher margins to cover their fixed costs.

Zone 3 margins have steadily increased over the period; possibly the service stations in that zone have recognized that they can increase retail price without losing volume.

Exhibit 3.54 Service Station Net Margins over the Study Period



Source: OPIS and PUC Transactions Database

The second method to identify Hawaii retail margins is to determine the specific margins of the 35 service stations which have data reported specifically by both OPIS and in the PUC transaction database. These margins are direct “back-to-back” purchase and sale data and should represent an accurate margin comparison. While the margins are only for 35 stations in Hawaii (about 10% of the Hawaii retail outlets), the results are very comparable to the data presented in Exhibit 3.54.

Exhibit 3.55 shows the specific results by individual station in each zone, and the average for the zone ("Station Average"). The first line in each zone is the "Zone-wide average". The data indicate that the individual station margins corroborate the zone average numbers extremely well, and show that the overall data presented in Exhibit 3.54 are a reasonably accurate depiction of retail service station margins in Hawaii over the study period.

Exhibit 3.55 Individual Service Station Retail Margins and Comparison with Zone Average

($/Gallon)		Gas Cap Period	Post-Gas Gap 2006	Full Year 2007	First Half 2008	2008 Report Study Period
Zone 1	Zone-wide Average	0.211	0.218	0.184	0.200	0.201
	Select Station Average	0.191	0.183	0.178	0.222	0.190
Zone 2	Zone-wide Average	0.260	0.336	0.254	0.258	0.275
	Select Station Average	0.257	0.290	0.200	0.224	0.240
Zone 3	Zone-wide Average	0.343	0.392	0.420	0.449	0.400
	Select Station Average	0.341	0.378	0.407	0.432	0.386
Zone 5	Zone-wide Average					
	Select Station Average					
Zone 7	Zone-wide Average	0.228	0.308	0.223	0.238	0.246
	Select Station Average	0.291	0.354	0.221	0.211	0.279
Zone 8	Zone-wide Average	0.353	0.405	0.373	0.432	0.386
	Select Station Average	0.374	0.451	0.379	0.493	0.406

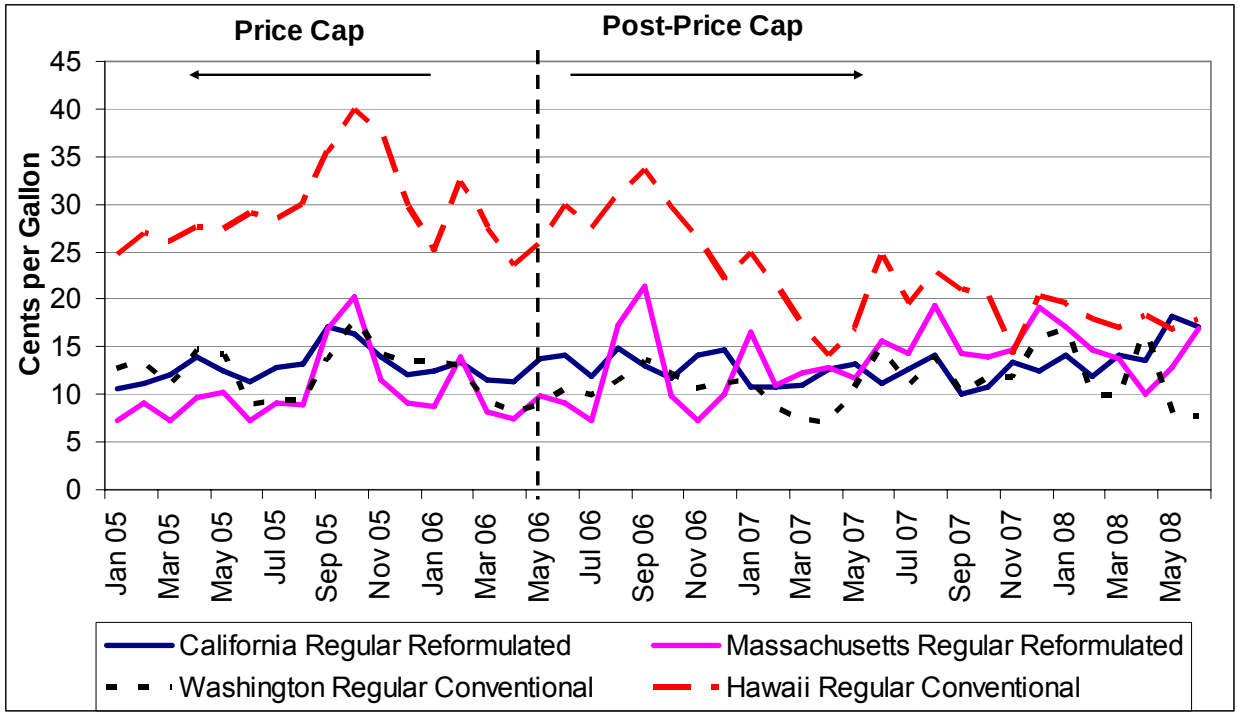
Source: OPIS and PUC Transaction Database

In order to determine the overall level of Hawaii retail margins compared to other regions in the United States, an analysis was done using Energy Information Administration (EIA) data reported by oil companies over the period from January 2005 through July 2007. The states chosen for comparison have a significant DTW volume sold in the state to insure that there is a reasonable "cost" base of data. The sales basis for the data is the Retail Sales to Company Operated Outlets. This margin compares retail prices from the Company Operated Outlets to DTW purchases from dealer or distributor operated outlets and is not, in fact, "back to back." However, Company Operated Outlets price on the street competitively with other service stations in their marketing region, and this was judged to be a reasonable estimation of retail margins in the states presented.

Exhibit 3.56 shows the calculated EIA margins for Hawaii, California, Massachusetts and Washington for the identified gasoline formulations. The Hawaii margins are shown to demonstrate that the EIA calculation process provides a reasonable estimation of the actual retail margins seen in Exhibit 3.53 and Exhibit 3.54. This exhibit shows that Hawaii average retail margins reported to the EIA over the gas cap period (beginning September 2005) are above the margins in the three comparison states. Margins in several of the zones outside Oahu, in particular Maui and Hawaii Zone 8 are significantly above these averages.

There is insufficient data to determine the relative costs of operating a retail outlet in Hawaii versus the states in questions. All three comparison states have major population centers with very high real estate values compared to the U.S. average, although Hawaii values are likely higher. Other factors such as service station throughputs would also be a consideration.

Exhibit 3.56 Comparison of Statewide Hawaii Retail Margins to Other States



Source: EIA Petroleum Price Data

Note: Sale price is monthly company-owned retail outlet prices ("Through Retail Outlets"):
Acquisition price is monthly DTW prices ("DTW"):
California and Massachusetts "Total" numbers are the same as "Reformulated" numbers (verified 2000 onward);Hawaii "Total" numbers are the same as "Conventional" numbers (verified 2000 onward).

Retail Margin Summary

Retail service station margins in Hawaii have ranged from $0.15/gallon to $0.50/gallon depending on the zone. The higher margins are in the zones outside of Oahu, with Maui, Hawaii Zone 8, and Lanai being significantly higher than Oahu. Retail margins were not part of the Gas Cap process, and there is minimal data available through the PIMAR process for identifying retail service station costs.

Comparison of retail margins with specific station data in Hawaii corroborates the overall findings. Comparison with several states data as reported to EIA indicate that Hawaii retail margins may be, on average, $0.10/gallon or more above service stations in those states.

Gasoline Market Observations and Issues

The PIMAR process has provided access to a significant amount of information on the petroleum market in Hawaii, and in particular the gasoline market. This new report includes data through mid-2008. Noted below are some updated observations on the gasoline market in Hawaii based on the additional information from the PIMAR system over the past year.

This section will include current observations as well as some updated comments on three key questions requested by the Commission in the 2007 Report noted below. These are as follows:

1. How can competition in the gasoline wholesale market in the State of Hawaii be increased?

2. How can the pre-tax wholesale price of gasoline in the State of Hawaii be decreased?

3. How can the market or the efficiency of the market for gasoline in the State of Hawaii be improved?

The 2007 Report includes assessments of the impact of the Gas Cap legislation and discussion of issues around the gasoline market in Hawaii. This section is repeated in the Appendix (see Appendix 2) as it may provide some useful background to the reader.

Observations

The key observations from the gasoline analysis are noted below. In some cases these observations are consistent with the 2007 Report, but differences are noted.

1. The price of gasoline from the refiners to suppliers in Hawaii is reasonably competitive with other markets. The actual commercial terms between the refiners and three primary suppliers (Aloha, Mid-Pac and Shell) are competitive with sourcing product in the Far East or U.S. with freight adjustments. The three suppliers have negotiating leverage with

the two refiners since all three have capability to physically import product if the refiners will not provide mutually agreed import parity access to gasoline.[27]

The analysis indicated that Hawaii refiner margins for gasoline bulk price are competitive with other markets, and also provided bulk gasoline margins reasonably consistent with U. S. mainland refiners

2. During the Gas Cap period, changes in gasoline DTW price took place completely in sync with the changes in the gas cap weekly calculation. In other words, the gas cap was driving gasoline prices in Hawaii. This may seem an obvious observation. However, it is important to recognize that while the gas cap was driving DTW prices from refiners, suppliers and jobbers, there was a dichotomy occurring between the gas cap as calculated by the formula and the actual cost of gasoline to the suppliers.

   The legislated gas cap calculation used OPIS gasoline prices in New York, the Gulf Coast and Los Angeles as a baseline, plus a $0.04/gallon freight adjustment to determine the "import parity" into Hawaii. The commercial terms between refiners and suppliers were not on the same basis. This created a situation where suppliers could either "make money" or "lose money" depending on whether or not their cost of product from refiners increased or decreased as the legislated import parity calculation changed.

3. Following the gas cap period supplier margins increased initially in late 2006 due to falling petroleum prices worldwide. The declining DTW prices tended to lag the declining acquisition prices and resulted in wider margins. Subsequently in 2007 supplier margins stabilized and have since been declining. This has been due to (in 2008) both rapidly rising global prices in the first half of 2008 and weak DTW prices compared to other market locations. The rise in prices created a similar, but reverse lag impact. The weak DTW prices appear to stem from lower gasoline sales in Hawaii in 2008 most likely due to higher prices and reduced tourism demand.

   Since Suppliers are acquiring gasoline at prices based on Mainland and/or Singapore spot markets (plus a location differential), the inability to recover their costs through DTW prices created clearly lower gross margins in 2008 for all suppliers.

4. The price difference for premium and midgrade gasoline versus regular at the DTW level were controlled during the gas cap period, and increased following suspension of the gas caps. These prices initially increased to offset higher bulk prices from refiners (which increased due to higher spot prices for premium grades in the U.S. market). The higher spreads for premium and midgrade versus regular have been generally sustained despite subsequent declines in refiner bulk premiums versus regular gasoline. Recent data indicate that refiners and suppliers are reducing the premiums for the higher octane grades vs. Regular, but they are still well above gas cap premium levels.

5. Jobber margins tended to range between $0.05/gallon and $0.15/gallon during the gas cap period, with some jobbers increasing their margin by an additional $0.10/gallon or more in the period following gas cap suspension.

[27] See Federal trade Commission vs. Aloha Petroleum and Trustreet Properties, July 27, 2005, requiring that Aloha divest import storage at Barber's Point to Mid Pac to protect competition in the wholesale market.

6. Retail service station margins in Hawaii have ranged from $0.15/gallon to $0.50/gallon depending on the zone. The higher margins are in the zones outside of Oahu, with Maui, Hawaii Zone 8, and Lanai being significantly higher than Oahu. Retail margins were not part of the Gas Cap process, and information on retail station costs are not accessible in PIMAR. However, comparison with estimated retail margins in other states would appear to indicate that Hawaii retail margins are about $0.10/gallon above mainland states such as California, Washington and Massachusetts.

   Retail margins showed a moderate increase in late Spring 2008 data for several zones. Future reports may identify if this is an anomaly or indicator of higher retail pricing strategies. It is a possibility that lower gasoline sales volumes may be influencing retailers to be pushing higher prices to preserve their income.

In summary, the bulk gasoline prices from refiners to suppliers appear market competitive. Supplier margins overall are becoming very tight in 2008 after a very strong performance in 2006. This has been due primarily to the fact that DTW prices are declining versus benchmark locations. Jobber margins are lower, with a couple exceptions that have had higher margins following gas cap suspension. Retail margins are higher than relatively comparable states on the mainland, with some zones much higher.

The lower DTW prices in the Hawaii market in 2008 have benefited consumers since prices have not risen as quickly as in Mainland markets. This has mitigated some of Hawaii's overall higher gasoline price profile versus other states. Of course, higher retail margins and taxes continue to be higher price factors in Hawaii, and the rapid drop in market prices in late 2008 will likely bolster supplier margins.

Key Questions

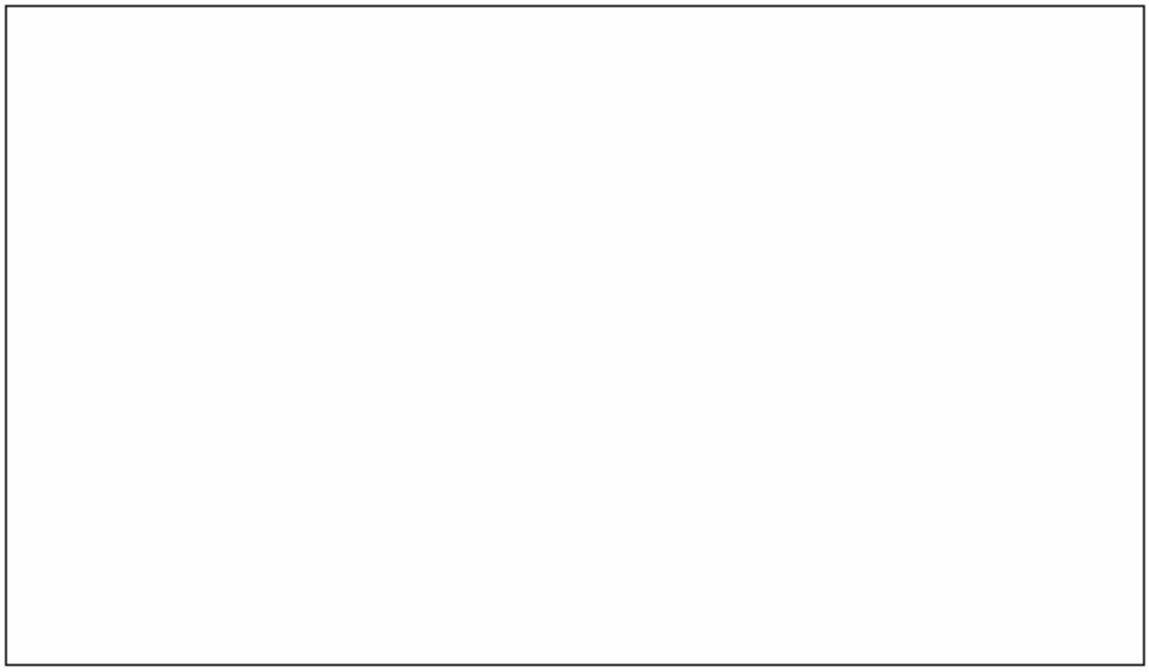
Competition in the wholesale market is constrained by Hawaii's small market size, disconnection from other markets, and lack of incentive for any existing market participants to alter their profile as discussed above. With access to HIBOB controlled by the refiners, and potentially less ability to import HIBOB-compatible blendstock than conventional gasoline, it is difficult to see how competition can be increased, and therefore wholesale prices reduced.

That being said, there is clearly a spread between wholesale prices to service stations, as shown by Exhibit 3.57 below charting average DTW prices in Zone 1 during the full study period. Even with gas caps in place, some suppliers' average wholesale prices were as much as $0.15/gallon below others.[28] This indicates that there is some competition in wholesale markets in Hawaii, and certainly different pricing strategies that are being employed.

The additional observation from this chart is that over the entire study period each supplier tends to price consistently at some premium or discount versus the other. The relative "ranking" of the highest to lowest gasoline price is unchanged over the period.

[28] These prices do not include any sales to the military, hypermarketers or commercial accounts.

Exhibit 3.57 Average DTW Prices in Zone 1, Study Period



Source: PUC Transaction Database

ICF also examined the gasoline transaction data following the gas cap suspension to assess how gasoline prices are changed in Hawaii. The questions that were critical were: (1) Is one party the first to move DTW price, then the others follow? (2) Do all parties change price together? (3) Do prices go up or down immediately after U.S. spot prices, or NYMEX prices, or Singapore prices change? We looked at average DTW prices in Zone 1 for the suppliers in the Exhibit above, as well as focusing on several individual service stations, looking at day to day discreet changes over two or three several month periods.

This analysis showed that is no conclusive pattern that answers any of those critical questions. No one supplier leads price changes; there is no "collective" moves on prices – some parties update DTW prices weekly or randomly; others more frequently; prices sometimes change following changes in the market centers (Gulf Coast, Singapore, etc.) but almost never on the same day or following day, and it is different for each supplier.

The analysis result, while not revealing a pattern, does in fact support a contention that the Hawaii market is different than the mainland. On the mainland, it would be extremely unusual to have futures prices or spot market prices change by several cents per gallon and not expect a commensurate change in all suppliers' prices at racks and for DTW accounts. That does not happen in Hawaii. In Hawaii, suppliers buy from their "refiner", and sell to their DTW accounts and jobbers. There is no fear that a jobber may buy product from a different account if the supplier doesn't "keep pace" with the market price changes. Over time, the data show that Hawaii DTW prices ebb and flow with the mainland (and Singapore) commodity prices, but it is not a pricing pattern where the entire market changes every day a similar amount.

One of the reasons for this is that each of the refiners and suppliers has different cost structures for their gasoline. Refiners' cost changes as the crude market changes; suppliers' cost change as their contract terms with refiners change. The contract terms may change suppliers'

acquisition prices on a daily, weekly or monthly basis in Hawaii whereas it is typically on a daily basis on the mainland.

The end result of the pricing adjustments up and down, however, remains best determined by Exhibit 3.57. Over the period, the relative pricing between most suppliers is fairly similar.

Decreasing the pre-tax wholesale price of gasoline in Hawaii is largely dependent upon increasing competition. Based on the above discussion, that will be difficult to achieve by any entrant of new market participants. There are, however several recommendations that ICF has for the PUC to consider which may influence gasoline prices in Hawaii, as noted below:

1. The primary recommendation is to continue the development of the PIMAR program with a number of modifications as identified in the last section of this report. The transparency that this program can provide will provide significant value over time. Market participants will understand that their actions are being monitored, and will be visible. The report does provide extensive data to make margins visible, and the initial two reports have shown minimal evidence of aberrant pricing behavior by the parties.

2. Continue to have the Gas Cap legislation suspended. Consider recommendations to the legislature for modifications to the Gas Cap factors which will better align gas cap baseline price and location differential to commercial terms. It may be necessary to keep the Gas Cap legislation in a suspended mode (rather than repealing the legislation) as a possible control mechanism if the PIMAR process does not achieve desired results.

3. Emphasize to Hawaii consumers, potentially with support from DBEDT, that use of premium and midgrade gasoline may not be a requirement as per the car manufacturer's driver instructions. Using regular gasoline may save many consumers unnecessary expense.

4. Emphasize to consumers that continued actions on their part to reduce gasoline consumption have a clear impact on the market price. The evidence in Hawaii is best seen by the weak DTW prices versus spot market prices on the West Coast, Gulf Coast and Singapore.

5. Achieve a better understanding of the costs of the wholesale supply business in Hawaii. The supplier margins are being squeezed in 2008, but have been high in prior periods. As noted, there is minimal incentive for any supplier to push prices lower to improve market share. Gross margins appear even higher in most zones outside Zone 1, but costs are also greater in most cases. (The Profit Report submitted in 2008 shows cost profiles for the reporting parties which appears to confirm relatively high costs are required to operate the business in Hawaii, but more data reporting on costs would be helpful).

6. Retail service station margins in Hawaii in all zones appear to be quite a bit higher than several mainland states, with many zones outside Zone 1 again having much higher margins. While analyzing retail a margin was not an object of the PIMAR process, a better understanding of the need for higher retail margins should be explored.

Any actions to reduce the wholesale price of gasoline can potentially undermine refinery profitability. This may not be a significant concern if the refiner-supplier commercial terms continue to insure that the refinery gasoline produced achieves import parity price. Refinery profitability would be more impacted by higher and higher global costs for sweet crude, lower and lower sulfur requirements in diesel and potentially other products, and legislation to reduce carbon emissions. This is discussed in Section 6.

Improving the efficiency of the market for gasoline in the State of Hawaii implies that there are options that would allow gasoline to be provided more efficiently to Hawaii consumers, and presumably at lower cost.

The existing supply chain in Hawaii must overcome significant challenges in a small market with a high dependence on waterborne supply to all zones outside Zone 1. The delivery of product through the terminal system and to a number of service stations in remote locations appears to work as well as could be under those conditions. The integration of ethanol required a complete parallel supply chain to be developed and integrated into the petroleum supply chain, and this process also has been implemented by the oil industry in a timely and efficient manner despite the requirement to import ethanol when planned in-state supply did not develop.

While all these activities are performed effectively to deliver product to consumers, the fact that the Hawaii market is small and “dislocated” necessitates higher costs. This starts with Hawaii’s higher crude costs, due to smaller crude cargo volumes than most other U.S. refiners, which increases freight cost. Smaller refineries have higher fixed costs per gallon of product. Movement of product by barge is expensive and will get more expensive as all barges must be double hulled in coming years, and barges used in Hawaii tend to be smaller than many mainland markets. Terminals must be operated and maintained despite lower throughputs than mainland terminals and therefore costs are higher per gallon. Changes with ethanol as well as lower diesel fuel sulfur levels trigger imports of ethanol and ULSD in small cargoes and exports of unfinished products to balance, again in small parcels.

This report has some data to delineate some of these costs that get built into the Hawaii market, but not all. Completion of all the required PIMAR data for profit analysis may provide some numbers that translate the impact of the small market on costs. The ability to streamline the system, lower cost and improve efficiency is limited.

4 Assessment of Prices and Margins in Hawaii for Other Products

Jet Fuel Price Analysis

This section will use both the PIMAR and IPIR data to identify jet fuel price trends in Hawaii over the study period. Jet fuel is a key refinery product, and the objective of the price analysis is to identify trends in jet fuel prices in Hawaii, and whether the prices for jet fuel in Hawaii are market competitive.

Exhibit 4.1 shows Hawaii Zone 1 average jet fuel wholesale prices compared with landed crude costs. Zone 1 prices are shown because they represent the largest portion of jet fuel sales in Hawaii. The jet fuel price over the study period appears to track the crude oil price reasonably well. [redacted]

The rise in jet fuel prices in the second quarter of 2008 is a significant increase, [redacted] The basis for the wholesale price increase vs. crude price is not immediately evident, but may reflect to some degree the fact that Hawaii refiners worked to lower their cost of crude oil in 2008 (versus markers such as WTI as shown earlier). This would have enabled somewhat higher margins versus landed crude in Hawaii if jet continued to be priced at global market prices.

Exhibit 4.1 Hawaii Jet Fuel Wholesale Price vs. Landed Crude

Source: IPIR and PIMAR: Category 9 (Jan '07-Jun '08)

Exhibit 4.2 Hawaii Jet Fuel Wholesale Price and Landed Crude Cost Spread

Source: IPIR and PIMAR: Category 9 (Jan '07-Jun'08)

Exhibit 4.3 shows Hawaii jet fuel average wholesale prices tracked against crude prices for selected Indonesian and Far East crudes which are typically run in Hawaii or are regional benchmarks. A similar pattern exists to the trend versus Hawaii landed crude costs.

Exhibit 4.3 Hawaii Jet Fuel Wholesale Price Spread vs. Far East Market Crudes

Source: IPIR and PIMAR: Category 9 (Jan '07-Jun '08)

The above exhibits show that there is a strong correlation between jet fuel prices and crude costs. However, the correlation does not necessarily mean that the jet fuel price in Hawaii is competitive with other markets. In order to evaluate that, it is necessary to compare Hawaii jet fuel prices to possible import sources for jet fuel into Hawaii.

Exhibit 4.4 shows the Hawaii jet fuel wholesale prices (shown as 'Jet Fuel' in the exhibit) compared to jet fuel spot market prices in Singapore, Korea and the USWC (U.S. West Coast) cargo market. The exhibit shows that the Hawaii wholesale jet fuel price has a very strong relationship to the West Coast Cargo market price. The Hawaii price averages [redacted] below the West Coast prices in 2007-2008 YTD. This shows that jet fuel prices in Hawaii are depressed versus the West Coast, however they are sufficiently high enough to attract imports from the Pacific Rim markets.

This chart indicates that Hawaii jet fuel prices do move in direct correlation with West Coast prices, as well as Singapore and Korea. Therefore, the spike in jet fuel margins in the second quarter of 2008 are more market related premiums for jet fuel than any Hawaii specific price aberrations.

Exhibit 4.4 Hawaii Jet Fuel Wholesale Price vs. Other Markets

Source: IPIR, PIMAR: Category 9 (Jan '07-Jun '08), and Platts

As noted, the Hawaii price also correlates well with the Singapore and Korea market. While the Singapore and South Korea absolute prices were significantly lower than Hawaii [redacted] through late 2007, those prices have narrowed into 2008. Virtually all the jet fuel imported into Hawaii comes from the Korea and Singapore markets, and the price basis is very liquid. Transportation costs to Hawaii from that region are typically well under [redacted] which has enabled jet to flow economically to meet Hawaii demand. The recent trend of compressed pricing between these markets may be making jet fuel import economics less attractive. This may tend to drive Hawaii jet prices higher to allow importers to recover the costs of transportation.[29]

While the majority of jet fuel consumption is on Oahu, the jet fuel demand in the other zones is not insignificant due to the critical nature of airline traffic to the states' commerce. Exhibit 4.5 and Exhibit 4.6 compare the prices in other zones to Oahu. The jet prices in the zones are shown below from January 2006 forward (data prior to January 2006 appear to have inconsistencies). Prices between the zones vary month to month, but on an average basis the differentials for zones 2, 5 and 6 are high. Zone 3, which has a higher volume of jet sales than the other 3 zones, has a lower premium. The transportation cost to zone 3 is likely smaller since larger barges could be used. Smaller barges would increase cost to the other zones. While the cost would be higher to the lower demand zones, the actual price differentials are higher than one might expect.

29 [redacted]

Exhibit 4.5 Hawaii Jet Fuel Wholesale Price Spread vs. Other Zones, 2007-2008 YTD

Zone	Average Premium vs. Zone 1, cpg
2	
3	
7	
8	

Source: IPIR and PIMAR: Category 9 (Jan '07-Jun '08)

Exhibit 4.6 Hawaii Jet Fuel Wholesale Price Spread Trend vs. Zone 1

Source: IPIR and PIMAR: Category 9 (Jan '07-Jun '08)

The trend data show the seemingly unusual data versus Zone 1 prior to January 2006. Following that period, however the data is more consistent and results in the average price differences shown in Exhibit 4.5.

The final area to examine would be the comparison between jet fuel import landed prices and the jet fuel wholesale price in Hawaii. There is minimal data on jet fuel import costs to make this comparison since HFFC, the primary importer, was not required to report imported prices in the IPIR database, and has not reported prices in the PIMAR database. This information will need to be resolved with HFFC and the purchasers of the jet fuel for import. The fact that jet fuel flows routinely into Hawaii from Korea and the Far East markets indicates that prices in Hawaii are strong enough to attract demand. Prices in Hawaii are not, however, out of line with competitive market prices on the U.S. West Coast.

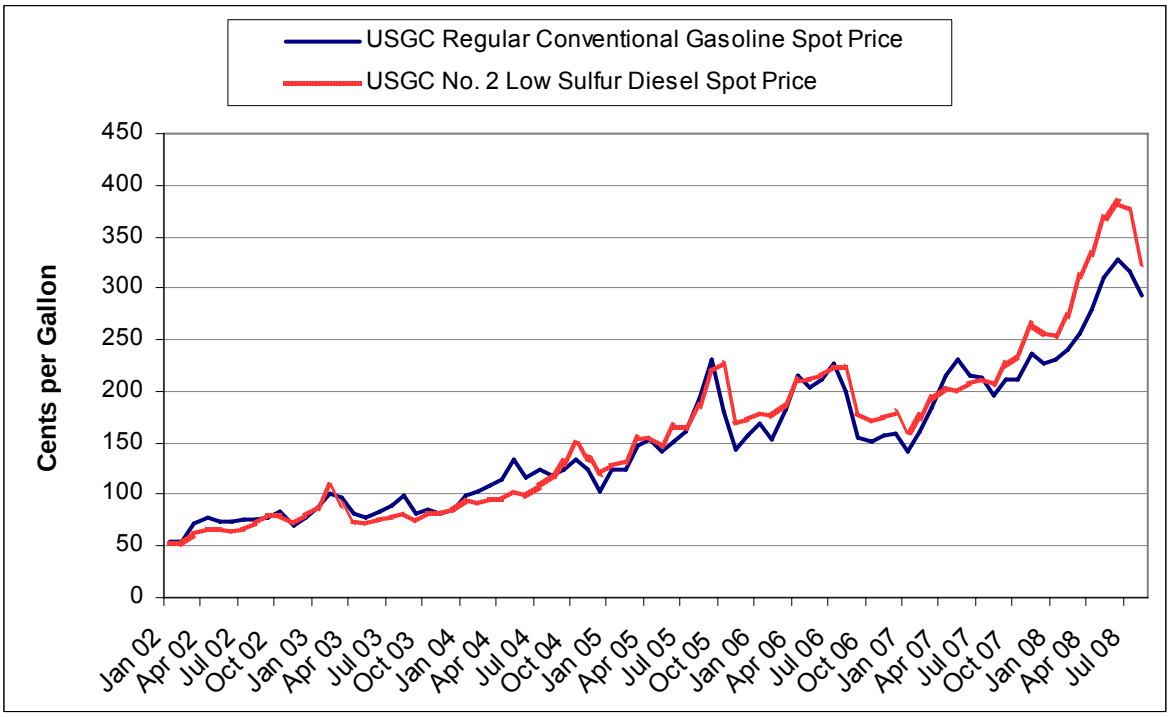
Our conclusion therefore is that the jet fuel market prices in Hawaii represent market competitive prices and are reasonable values for refiners on that basis.

Diesel Fuel Price Analysis

The Diesel market has changed in the past two years with the required introduction of ULSD (Ultra Low Sulfur Diesel) having a sulfur content less than 15 parts per million (ppm). The PIMAR forms capture three grades of diesel fuel. In addition to ULSD, PIMAR captures Low Sulfur Diesel (15-500 ppm) and Diesel over 500 ppm. Price data in this report will focus on diesel price trends from PIMAR data only due to the grade transition that may make prior price data from IPIR inconsistent.

As a result of strong global growth in diesel fuel demand as well as increasing efforts to reduce the sulfur content in diesel fuel, global wholesale prices for diesel fuel have exceeded gasoline price over the past three years (See Exhibit 4.7). Beginning in June, 2006, the allowable sulfur content in all diesel fuel used in the U.S. for on-road consumption was reduced from 0.05% sulfur content (500 ppm) to 0.0015% sulfur, or 15 ppm. On June 1, 2007, the sulfur specification for all off-road diesel[30] was reduced from 5,000 ppm to 500 ppm. These changes impacted the refiners in Hawaii by causing them to be required to lower the sulfur content of the diesel fuel produced in Hawaii.

Exhibit 4.7 U.S. Diesel Fuel Prices vs. Gasoline



Source: EIA

[30] Off-road diesel is used for agriculture, commercial usages, locomotives, etc.

There are a number of categories of diesel fuel sales in Hawaii. There are wholesale diesel sales, which are resold in the Hawaii market, and there are multiple categories of sales to end users, including commercial sales, industrial sales, sales via retail service stations, residential, and other. The wholesale sales are smaller in volume than the other categories of sales, but are the closest price that would represent a refiner's margin and will therefore be used to compare with crude costs and diesel prices in other markets.

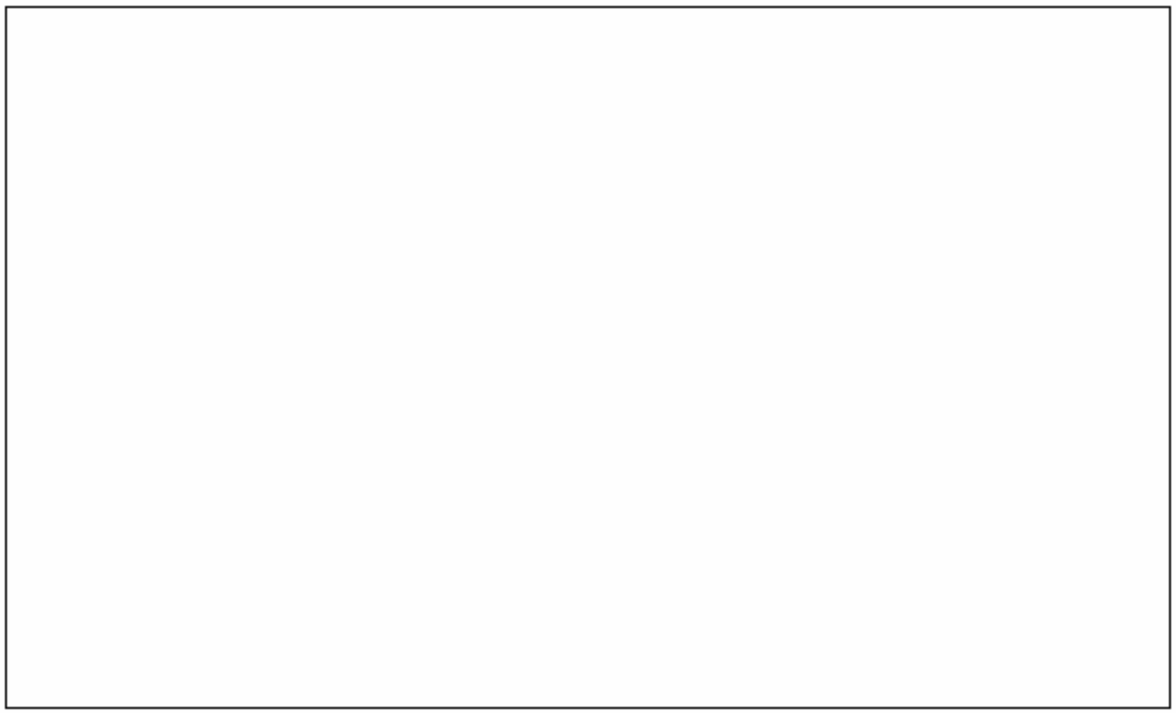
Exhibit 4.8 shows the Zone 1 wholesale diesel prices versus landed crude costs for Diesel 15 (ULSD), Diesel 15-500 (LSD) and Diesel 500 (HSD). This spread represents a "gross margin" for diesel fuel sales versus crude oil cost. The diesel exhibit generally follows crude price, however not with the same correlation as jet fuel prices.

Exhibit 4.8 Hawaii Diesel Fuel Wholesale Prices vs. Landed Crude

Source: PIMAR: Category 4

Exhibit 4.9 tracks the diesel prices against the same three Indonesian marker crudes shown in other exhibits. As with the comparison to Hawaii landed crude cost, there is some similar trending.

Exhibit 4.9 Hawaii Diesel Fuel Wholesale Prices vs. Far East Marker Crudes



Source: PIMAR: Category 4

The next exhibit (Exhibit 4.10) shows Hawaii diesel price against similar market diesel prices in other areas. The intent is to determine if Hawaii diesel prices are priced competitively with potential markets which could be import sources into Hawaii. The exhibit indicates that the Hawaii prices for ULSD and LSD track key West Coast market prices for LSD (Portland) and ULSD (Los Angeles). However, the relative correlation is considerably less than seen for jet fuel.

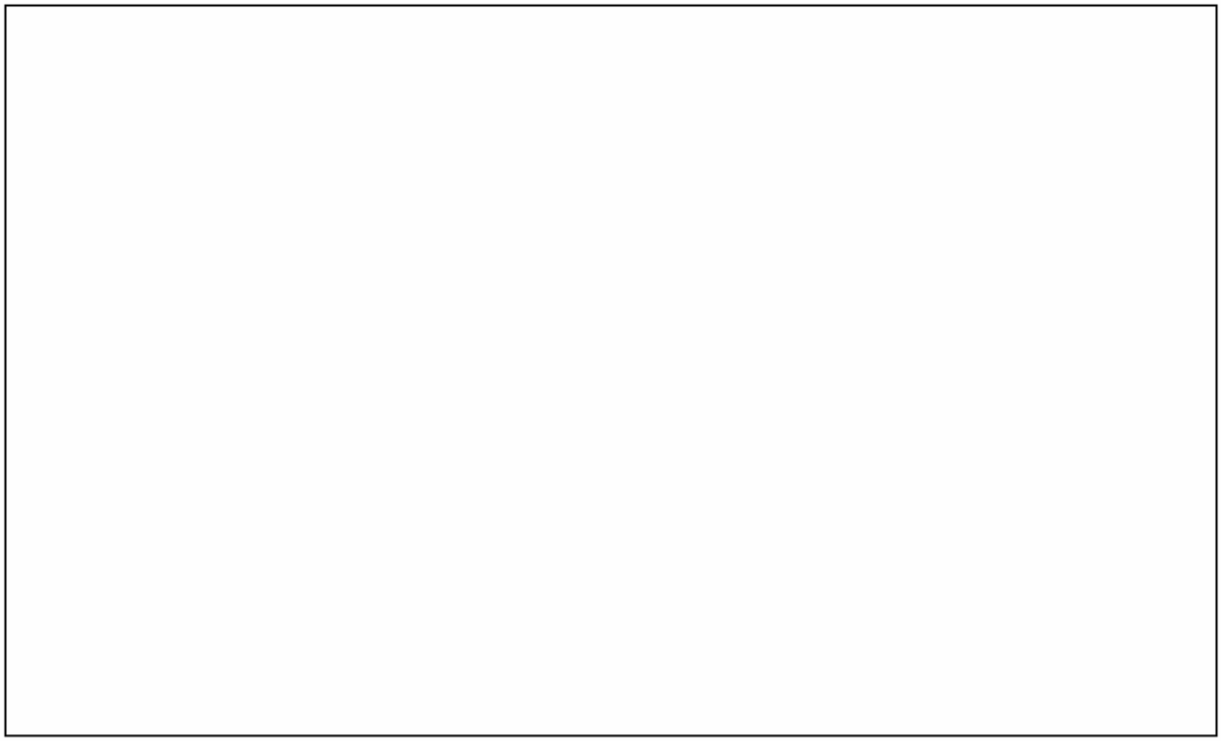
There are periods in 2007 and 2008 where the West Coast market was as much as 30 cpg above Hawaii, and another period where the Hawaii market was well above the West Coast market.

In both markets, it appears that in 2008 the differential between the ULSD and LSD grades has narrowed significantly.

The reasons for these variations most likely lies in the West Coast market pricing. The West Coast diesel market is much larger than the Hawaii market and is more likely to drive spread changes. The period in late 2007 and early 2008 where Hawaii prices “flipped” over West Coast prices was a winter period when West Coast product markets can be surplus, tending to depress prices somewhat.

Overall, the Hawaii prices in 2007 and 2008 have tended to be below West Coast prices, which means Hawaii consumers are not paying a location penalty for diesel fuel supply.

Exhibit 4.10 Hawaii Zone 1 Diesel Fuel Wholesale Prices vs. Other Diesel Spot Market Prices



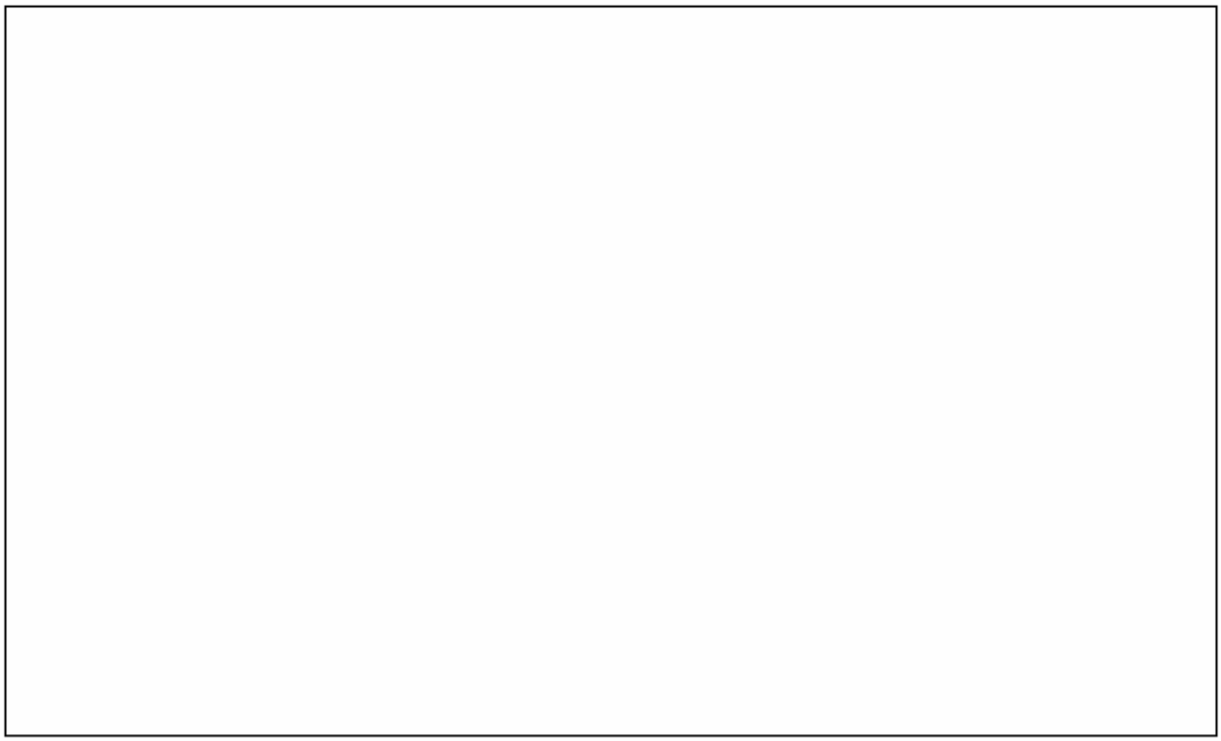
Source: PIMAR: Category 4

Exhibit 4.11 below compares the landed cost of several diesel fuel imports into Hawaii with the prevailing wholesale price at the time of delivery (wholesale prices before 2007 are LSD; after 2007 the prices are ULSD). The cargo imports show several periods of deliveries at well under the prevailing average LSD or ULSD wholesale price, and others at or above the wholesale price .According to U.S. EIA records, virtually all of these imported cargoes (primarily from the Far East) were in fact ULSD, or under 15 ppm sulfur. The implication is that Hawaii refiners or suppliers were having difficulty producing or buying ULSD and periodically required imports to meet sales requirements for on-road diesel.

The chart shows that the imported cargoes landed in Hawaii at prices at or just below the prevailing wholesale price in Hawaii (with one exception). This basically indicated that at the time the economics existed to import from those sources into Hawaii.

[redacted]

Exhibit 4.11 Hawaii Zone 1 LSD Landed Import Prices vs. Wholesale Price



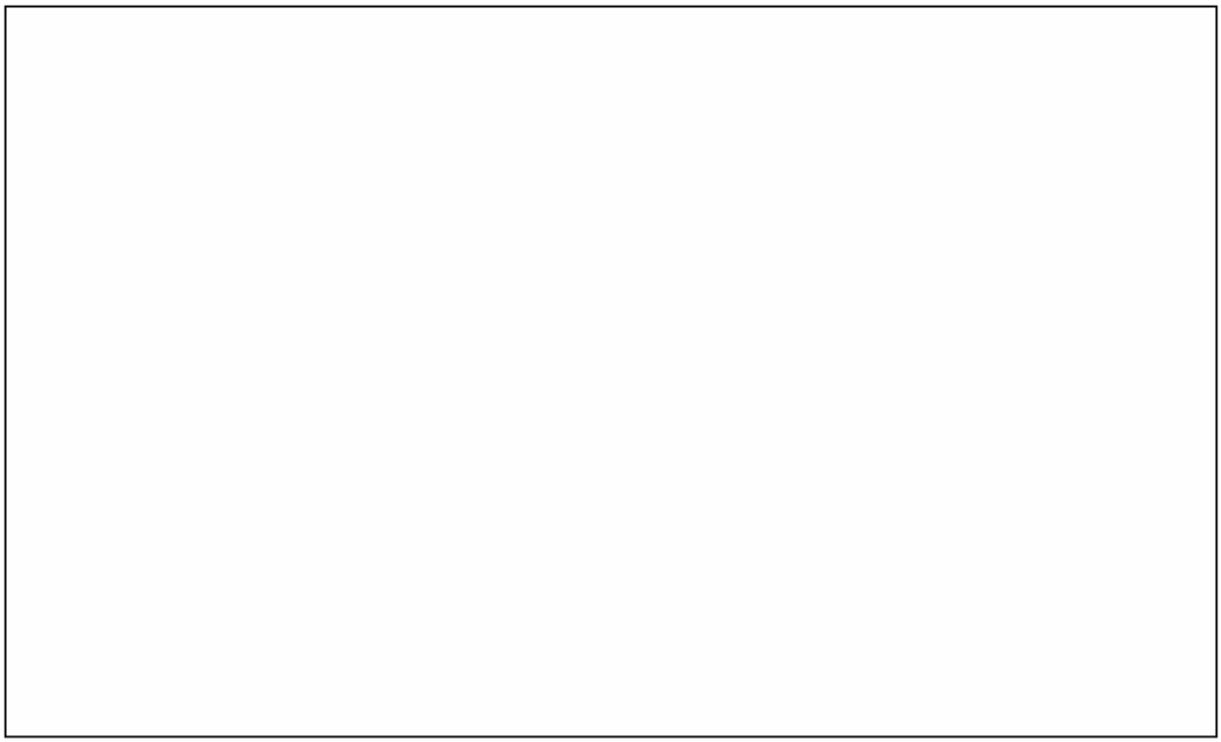
Source: IPIR and PIMAR

Exhibit 4.12 and Exhibit 4.13 show the wholesale diesel prices for other zones versus Zone 1 for both ULSD and LSD. Several zones were excluded due to limited data.

The ULSD exhibit shows that the zone differentials have varied over the period. The most recent trend shows that zone differentials have declined to [redacted] for most zones (excepting the small volumes in Zone 5). These differentials are likely within the transportation cost range between Zone 1 and the other zones.

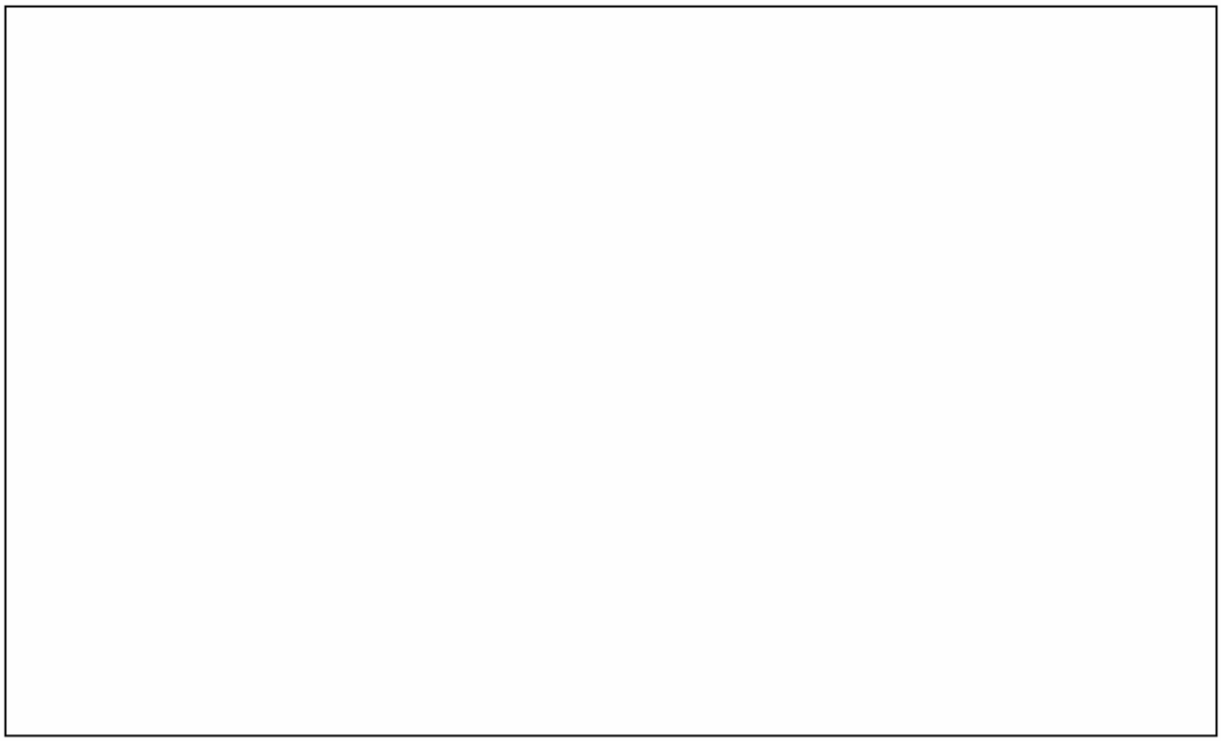
The LSD price spreads shown from mid-2007 to mid-2008 indicate a declining pattern versus Zone 1 over the period. The earlier data showed premiums that were well above reasonable transportation cost differentials from Zone 1; more recent data indicate that diesel prices in neighbor islands are more in line with transportation costs.

Exhibit 4.12 Comparison of ULSD Price in Zone 1 vs. Other Zones



Source: PIMAR: Category 4

Exhibit 4.13 Comparison of LSD Price in Zone 1 vs. Other Zones

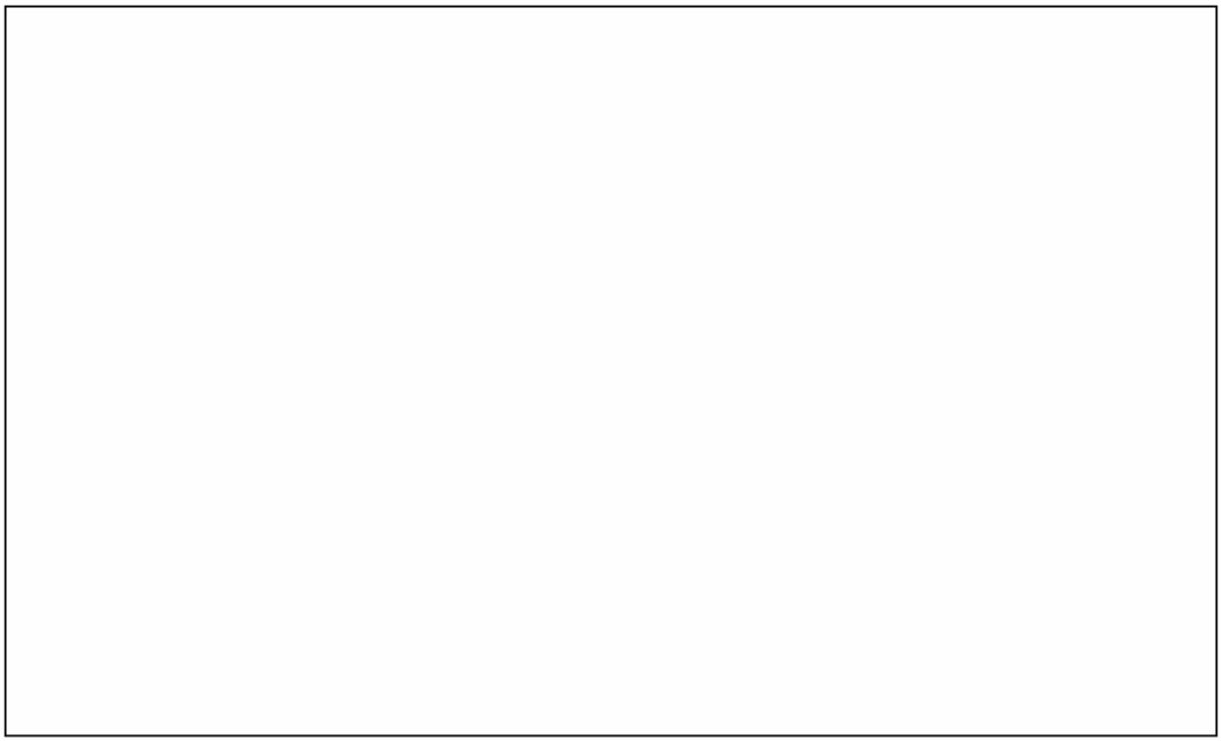


Source: PIMAR: Category 4

Diesel fuel sales to end users (similar to retail sales) in Hawaii are a larger volume than the wholesale sales. The practical meaning of this is that refiners are selling to commercial or industrial customers directly, as well as sales through retail service stations. These sales would generally be expected to be at a higher price since they are being sold on a delivered basis. Exhibit 4.14 and Exhibit 4.15 show the trend in End User sales versus wholesale sales price over the study period for both ULSD and LSD in Zone 1.

Exhibit 4.14 shows that ULSD has an average premium of about [redacted] in 2007 and [redacted] in 2008 for end user sales versus wholesale sales. For LSD sales on Exhibit 4.15, the margins averaged [redacted] and [redacted] respectively. This is a significant margin for the diesel end user sales. While sales to retail service stations incur some costs to suppliers, sales to commercial or industrial accounts are generally simply delivery costs and account management.

Exhibit 4.14 Comparison of End-User vs. Wholesale ULSD Price in Zone 1



Source: PIMAR: Category 4

Exhibit 4.15 Comparison of End-User vs. Wholesale LSD Price in Zone 1

Source: PIMAR: Category 4

Diesel Pricing Conclusions

Overall Hawaii wholesale diesel prices in 2007 and 2008 appear to be at lower than competitive prices versus U.S. West Coast markets (i.e., prices could arguably have been higher to be at import parity with those markets). Diesel wholesale prices in Hawaii versus landed crude costs as well as key marker crudes in the Far East do not appear unreasonable.

Within Hawaii, prices for ULSD and LSD have tended to come together in 2008, meaning that the market is not giving a premium to the lower sulfur grade. This is also being seen in West Coast markets based on the Portland/LA spread seen in Exhibit 4.10. When this occurs it usually means there is either adequate supply of the premium grade or some shortfalls of supply for the higher sulfur grade.

Diesel prices in Neighbor Island zones have, in the past year been within the range of typical transportation costs between the zones.

Diesel fuel sales are a complicated market to track, and the changing specifications and PIMAR reporting methodology (categorization of products) may need clarifications to produce better analysis. Use of a well-designed diesel fuel transaction database may be a consideration.

The diesel sales compared in this section reflect wholesale diesel sales. As described earlier in the report, the PIMAR system may not be capturing a large category of diesel sales to utilities for power generation. These retail sales are substantial and should be included in future reports.

Residual Fuel Price Analysis

Residual fuel is a major product of Hawaii's refineries. It is the heaviest portion of the crude oil processed in the refineries, and, unlike gasoline, jet fuel and diesel is always valued at a discount to crude oil in the commodity markets. Residual fuel is used in Hawaii and other regions of the world primarily for power generation by utilities and for bunker fuel requirements for ships. Residual fuel is also used in some commercial buildings for heating/boiler needs, and is also consumed internally in refineries for process heat requirements.

Demand for residual fuel in the U.S. is low compared to the transportation fuels, and most U.S. refineries are configured to produce minimal residual fuel. Hawaii refineries produce a much higher yield of residual fuel, and the higher production levels are required to meet Hawaii demands. Hawaii's power generation does not have access to coal or natural gas, and is much more dependent on refinery supply. Demand for bunker fuels in Hawaii is also high given the critical nature of the shipping business to the state's economy.

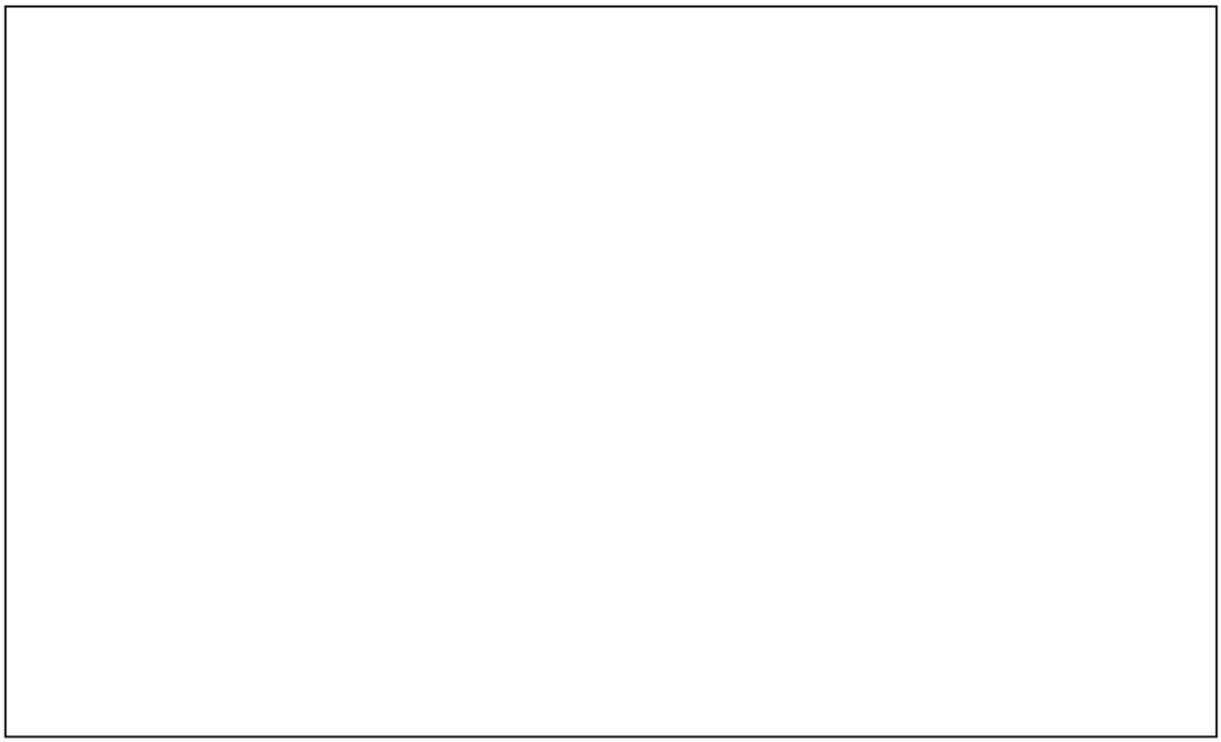
The PIMAR and IPIR data forms categorize residual fuel as either under or over 1% sulfur. As seen earlier, most of Hawaii's residual fuel production is under 1% sulfur. As with most products, residual fuel which has a lower sulfur level commands a premium in the market over higher sulfur residual fuels. The data shows that most of the residual fuel sold in Hawaii is categorized as "retail", which may reflect direct sales from refiners to utilities and other end users. There is also a significant wholesale volume, which is likely resold as "retail". PIMAR price data show very minimal differences between wholesale and retail prices, and for analysis purposes ICF will use retail price data as representing the majority of residual sales from

refiners. A very high percentage of sales are in Zone 1, which will be the sole focus for residual fuel analysis.

Exhibit 4.16 compares Zone 1 retail prices for both low and high sulfur residual fuel versus landed crude costs in the study period. This spread represents a “gross margin” for residual fuel sales versus crude oil cost. In this case the gross margin is actually negative, or a loss. The Exhibit shows both residual fuel grades are sold at discounts from crude oil cost. Residual prices generally follow crude price patterns, with the degree of discount varying over the period.

Residual fuel prices in 2005/2006 averaged about a [redacted] discount from crude for low sulfur resid, and about [redacted] discount for residual fuel over 1% sulfur. The chart indicates these spreads widened considerably in 2007 and especially in 2008 as crude prices rose.

Exhibit 4.16 Hawaii Residual Fuel Prices vs. Landed Crude Cost



Source: IPIR and PIMAR: Category 9

Exhibit 4.17 shows a table comparing the residual fuel discount versus crude oil in tabular format. The exhibit shows that low sulfur residual fuel discounts increased from a [redacted] discount to a [redacted] discount. Higher sulfur residual fuel discounts widened to over [redacted] in 2007 and over [redacted] in 2008. The increased discounts have a dramatic effect on refinery profitability. [redacted], a larger discount to crude's raw material cost will affect bottom line profits by [redacted] crude input for every increase in discount of a dollar a barrel. Refiners should gain that back with the most recent crude price collapse, but we anticipate 2007 and 2008 refinery profits will be eroded by this effect.

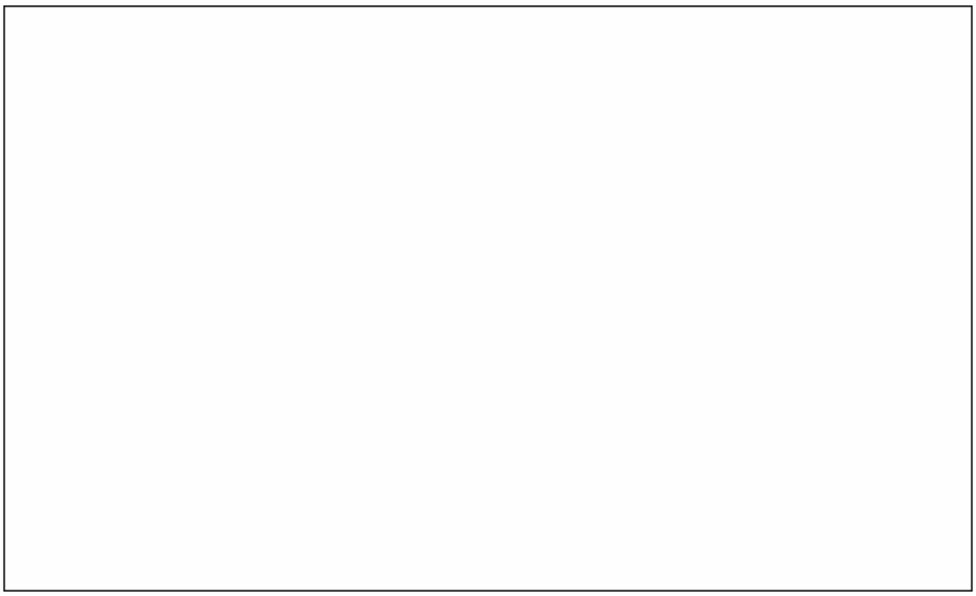
Exhibit 4.17 Hawaii Residual Fuel Prices vs. Landed Crude Cost, Table

Source: IPIR and PIMAR: Category 9

Exhibit 4.18 shows how several key residual fuel markets valued low sulfur versus higher sulfur residual fuel over the study period. The chart shows that the New York Harbor market for very low sulfur residual fuel can vary from a $5/barrel premium versus 1% residual fuel to an $18/barrel premium. Similar trends occur in the Gulf Coast market, although the premiums are for different grades (1% vs. 3% sulfur) and the premiums are generally lower. The Hawaii sulfur spread trend is also volatile, and [redacted].

These different sulfur fuels are targeted to different markets. Hawaii's over 1% residual fuel is primarily used for bunker fuels, with lower sulfur focused on power generation. Consequently their relationship can be difficult to rationalize since their demand is impacted from different markets.

Exhibit 4.18 Hawaii Residual Fuel Sulfur Quality Spreads vs. Other Markets



Source: IPIR and PIMAR: Category 9

The next exhibit (see Exhibit 4.19) compares Zone 1 retail residual prices to spot market prices for residual on the West Coast, Singapore, and the Gulf Coast. The intent is to assess whether Hawaii residual fuel sales prices are linked to a particular market price in other regions, and if the Hawaii prices are market competitive with those sources. The chart indicates that Hawaii residual fuel under 1% sulfur had a premium of about [redacted] above 1% sulfur West Coast residual fuel, and about [redacted] above Singapore 2% sulfur residual fuel through very late 2006. This premium dissipated thereafter to essential no premium. The price spread between Hawaii low sulfur residual fuel and Gulf Coast 1% sulfur residual fuel appears to have the most stable trend. This may indicate that the Gulf Coast 1% residual fuel price may be a benchmark for contract prices in Hawaii.

Prices for Hawaii higher sulfur residual fuel have been competitive with the West Coast and Singapore markers over the entire period. The prices of Hawaii's higher sulfur residual fuel versus the other markets are actually lower than expected since the Hawaii refiners do not appear to be gaining a location differential above West Coast or Singapore markets.

[redacted]

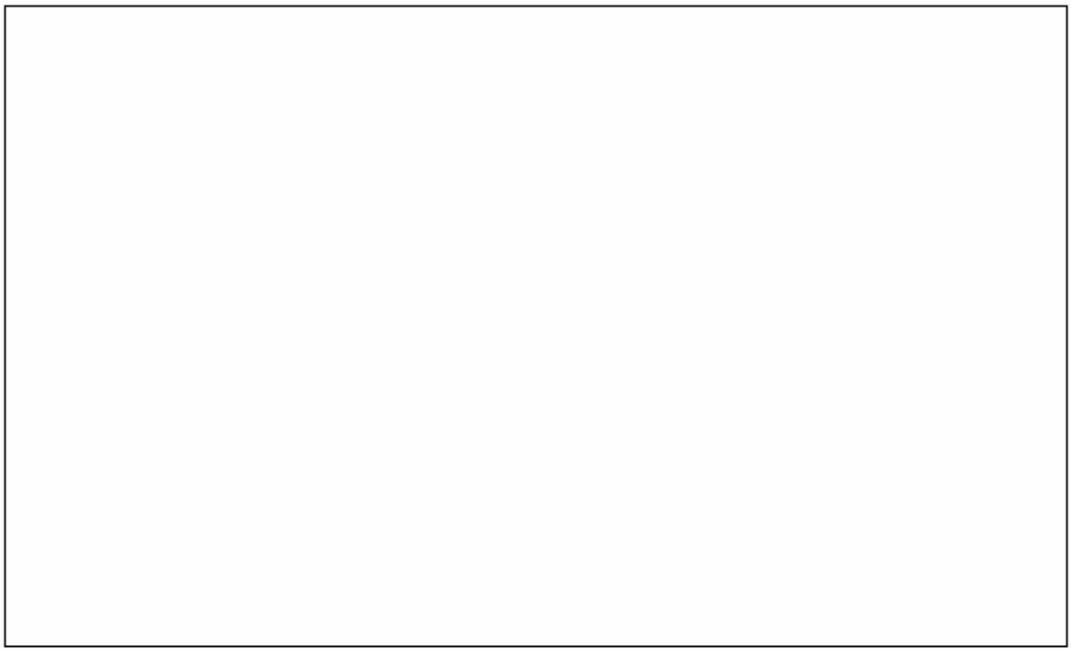
The chart does show that Hawaii refiners are seeing lower values for over 1% residual fuel compared to Singapore 2% and USWC 1% sulfur market prices. This indicates that Hawaii refiners are seeing downward pressure on price for the higher sulfur residual fuel.
The higher sulfur fuel is typically used for ship bunkering and this may indicate a reduced demand for that product (possibly related to tourism & cruise demand slowdowns).

Exhibit 4.19 Hawaii Residual Fuel Prices vs. Other Residual Fuel Markets

Source: IPIR and PIMAR: Category 9

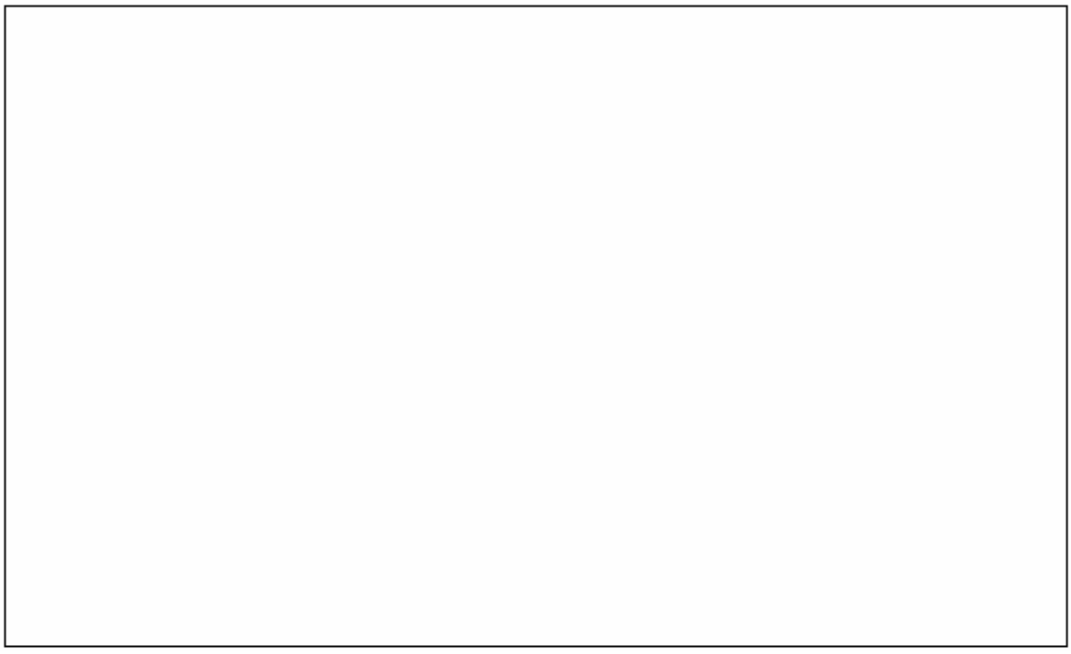
Exhibit 4.20 and Exhibit 4.21 compare the landed cost of residual fuel imports into Hawaii (from IPIR data) with residual fuel retail prices. The charts indicate that most of the residual fuel imports were early in the study period. Price analysis shows that the relative price of landed residual fuel imports in Hawaii versus prevailing retail prices in Hawaii were reasonably competitive with the imported cargo's price. One higher sulfur imported cargo in early 2007 appears to be significantly lower than the prevailing price, but the other imports are somewhat below or just above the retail market. These charts did not change from the 2007 report since no additional imports occurred.

Exhibit 4.20 Residual Fuel (< 1% sulfur): Comparison of Zone 1 Retail Costs vs. Landed Costs



Source: IPIR and PIMAR

Exhibit 4.21 Residual Fuel (> 1% sulfur): Comparison of Zone 1 Retail Costs vs. Landed Costs



Source: IPIR and PIMAR

Summary conclusions on residual fuel prices

Residual fuel prices in Hawaii appear competitive with other global markets for residual fuel. Periods where residual fuel has been imported indicate that Hawaii prices are high enough to attract economic imports, but not excessively high.

Refinery Gross Margin Estimation over the Study Period

The availability of an estimate of the refinery gross margin over the period gives a general indication of refinery profitability over time. In the 2007 Report, ICF recommended that a gross margin be estimated from landed crude costs and wholesale market prices. In a mainland U.S. refinery, the refinery margin is estimated by a 3-2-1 crack spread, which measures the margin from 3 barrels of crude being upgraded to one barrel of diesel and two barrels of gasoline. In Hawaii, ICF has developed a gross margin estimate based on average Hawaii yields of gasoline, jet, diesel and residual fuel. The estimate calculates the margin based on bulk gasoline prices, wholesale jet and diesel prices, and retail residual fuel prices. Tracking this margin can provide a consistent measure of refinery profitability. Prices for mainland margins are estimated based on U.S. Gulf Coast spot market prices for crude and products[31].

For the 2008 Report ICF continues to recommend use of the same process. The PIMAR data does provide a W-150 Report that reports the weekly margin for each refinery product and the crude price. This data, however, does not aggregate and weight by volume the yields of each product to arrive at an overall refinery gross margin profitability.

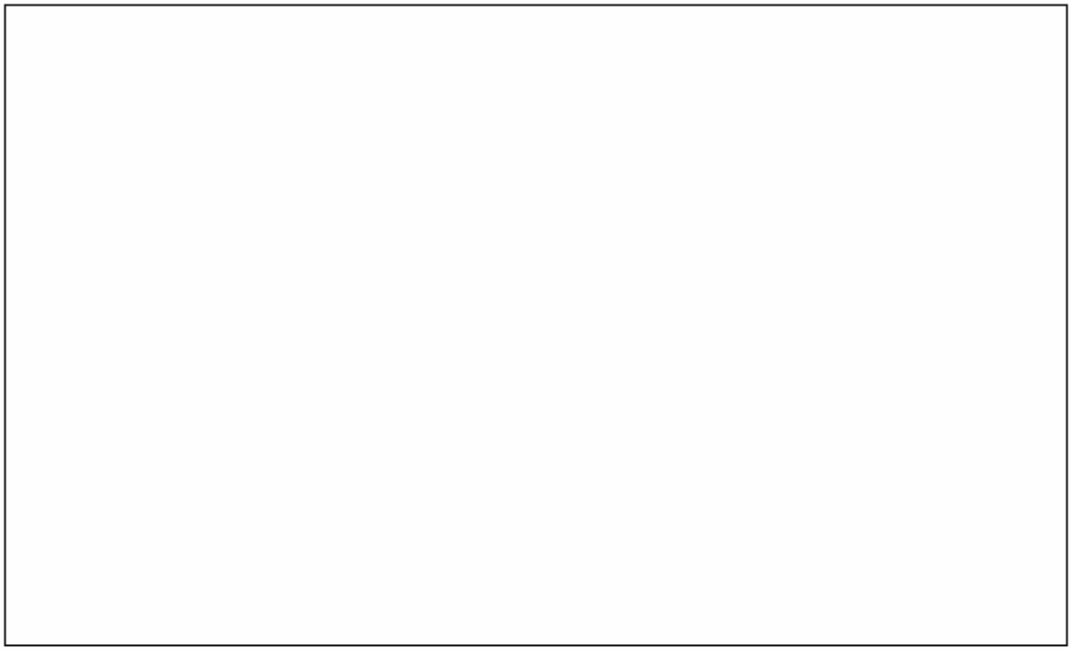
[31] Using EIA calculated RAC prices for crude oil and EIA product prices.

Exhibit 4.22 below shows the Hawaii gross margin calculation over the study period compared to the U.S. Gulf Coast 3-2-1 margin. Hawaii's margins average about [redacted] under the U.S. Gulf Coast margins over the study period ([redacted] for the Gulf Coast and [redacted] for Hawaii). This margin gap was as high as [redacted] in 2007 and has decreased to [redacted] in 2008.

The primary reason for the gross margin deficiencies are 1) Hawaii's much higher crude cost disadvantage due to processing light, sweet crudes (which has improved somewhat in 2008) and 2) Hawaii refineries poor yields due to low processing complexity. The poor yields produce a much larger quantity of residual fuel which is sold at large discounts to crude (as seen in the residual fuel pricing analysis section). Mainland and Gulf Coast refiners produce minimal quantities of residual fuel and thus have minimal penalties for yields.

On the positive side, the surge in diesel and jet fuel prices worldwide helps offset these penalties slightly, since Hawaii refiners yield about [redacted] diesel plus jet fuel versus typical Mainland refiners' yield of about 35%.

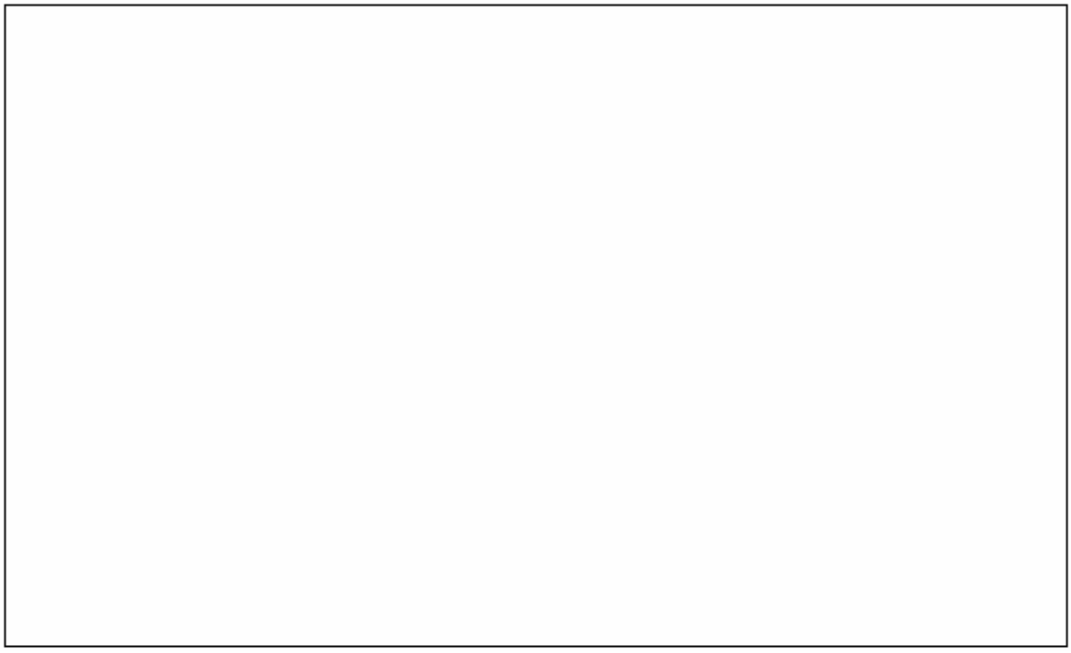
Exhibit 4.22 Comparison of U.S. and Hawaii Refinery Crack Spreads



Source: IPIR & PIMAR and EIA

In addition, we examined the relative product spreads versus landed crude costs for both Hawaii and the U.S. Gulf Coast. This was to again attempt to rationalize whether or not Hawaii's product gross margins versus crude are aligned with other U.S. markets. Exhibit 4.23 shown below, indicating that there is not any unusual divergence of Hawaii "refinery" margins from the Gulf Coast.

Exhibit 4.23 Hawaii and USGC Wholesale Product Prices vs. Crude Prices, 2005 to 2008 YTD



Source: IPIR & PIMAR and EIA

5 Comparison of Hawaii Profit Estimates with U.S. Downstream Refiner/Marketers

This section of the report is intended to report on the profit levels of the two Hawaii refiner/marketers (Chevron & Tesoro), as well as the three major suppliers (Aloha, Mid-Pac and Shell), and also to compare the Hawaii profit levels with reported profits of a number of large U.S. major refiner/marketers. The 2007 PIMAR report did not have sufficient information from the parties to determine and analyze profit data for the 2006 reporting year. This information was provided after the completion of the 2007 PIMAR report. A separate Profit Report was provided by ICF to the Commission in May 2008, with a final version in October 2008 to complete this portion of the report.

The required detailed financial information to assess the economic performance of the refiner/marketers and suppliers in Hawaii in 2007 has not as yet been submitted by the Parties to the Commission for analysis. This portion of the PIMAR reporting process will be completed after receipt and analysis of that information.

The profit comparison, even with complete data from the parties, contains several areas which make a rigorous analysis difficult. However, the regular reporting of the profits as part of the PIMAR process will establish a history of profits available for the Commission to track over time and identify trends and anomalies.

For this current report, presented below is an updated assessment of the financial performance of the domestic refining and marketing industry through 2007 (last year's report presented data through 2006). In addition, the estimated 2006 profit levels for Hawaii refiner/marketers (Chevron and Tesoro) based on the Profit Report submitted to the Commission in 2008 are presented for perspective.

The information provided below simply provides results rather than repeating the background assumptions of the analysis, explanation of the supply chain, and delineation of refiner/marketer and supplier/marketer business. This information is repeated from last year's report in Appendix 3.

Analysis of U.S. Refiner-Marketer Profits

Profit estimates for U.S. downstream refiner-marketers[32] was determined from their annual reports and 10-K's. This information was studied from 2002 to 2007 to provide a history of profit trends. The U.S. companies who are being analyzed include the following: ExxonMobil, Chevron, ConocoPhillips, Valero, Tesoro and Sunoco. Including Chevron and Tesoro is very appropriate since both companies have large systems outside their Hawaii business.

Profits for the comparison companies were evaluated on a before tax basis with absolute profits reported, as well as profits per barrel of reported input. The trend of these data was analyzed over the period, with general explanations for the trend based on market information over the period.

[32] "Downstream" refers to petroleum operations from the refinery to the service station. "Upstream" refers to petroleum operations from the oil or gas well to the refinery. Most company report their income in total, and also broken down by upstream or downstream segments.

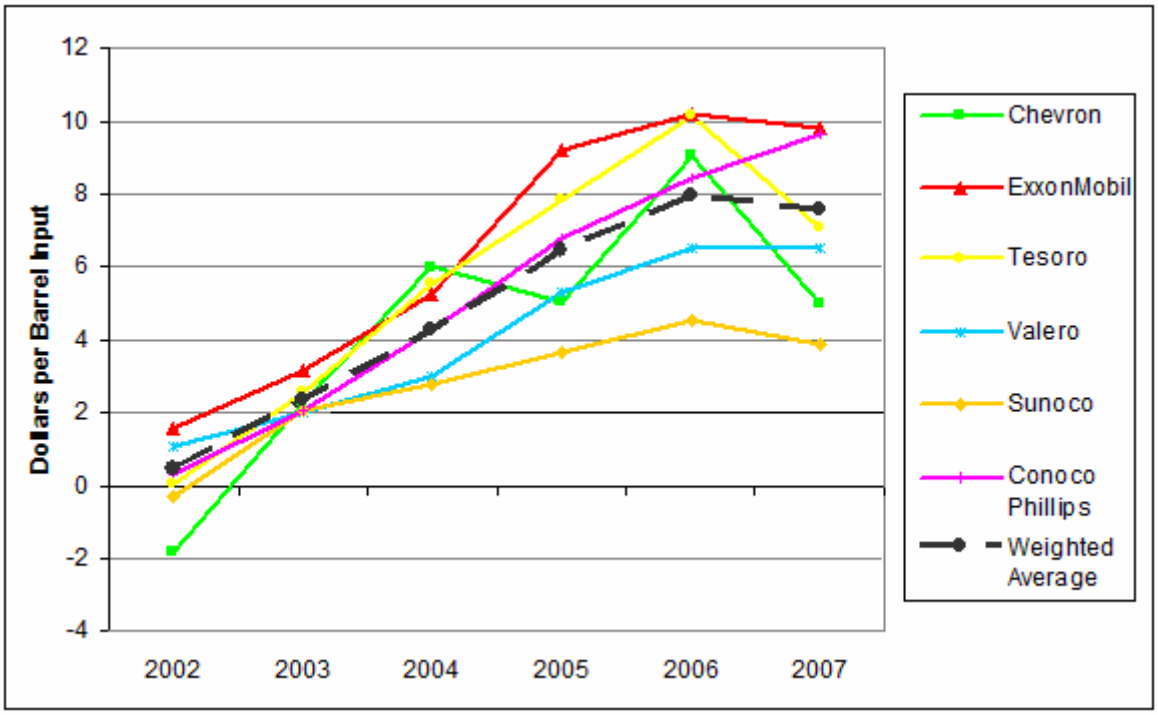
Exhibit 5.1 shows the profile of data for each of the six refiner/marketers in this study from 2002 to 2007. The data show that the profit levels for each company increased dramatically over the period. The relative difference in profits between these companies in any year can be significant. The difference stems from a number of factors, including throughput and sales, average refinery size, Marketing assets, location (West Coast refiner/marketers have enjoyed better margins than others), and cost control practices. Note that in 2007 refiner/marketer margins began to slide from peak levels in 2006.

The estimated 2006 profit levels for Chevron and Tesoro's refining/marketing business in Hawaii are shown as single data points on the exhibit. This information was presented to the Commission by ICF in 2008 based on data provided by the two parties on their 2006 financial performance in Hawaii.[33]

For Chevron, the data indicate that Chevron's Hawaii profit estimate is about [redacted] compared to Chevron's overall U.S. (including Hawaii) estimate in 2006 of about [redacted] For Tesoro, the Hawaii profit estimate is a bit over [redacted] compared to Tesoro's U.S. profit level of about [redacted].

It is obvious that both Chevron and Tesoro's profit levels in Hawaii are very low and significantly lower than all the other major oil companies. In addition, both refineries appear to be very weak links in the financial performance of both companies refining and marketing businesses.

Exhibit 5.1 U.S. Refiner/Marketer Before-tax Income per Barrel Input

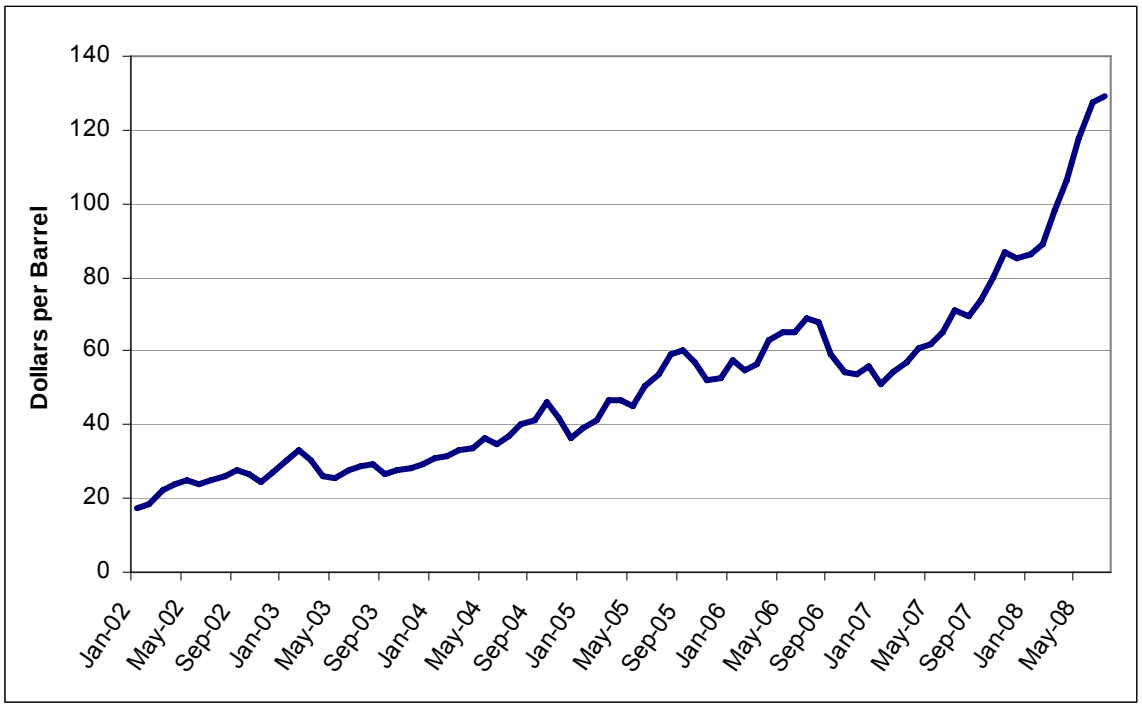


Source: SEC 10-K and 10-Q Filings

[33] The report also presented data from Aloha, Mid-Pac and Shell for profits in 2005 and 2006, however their business models are not the same as the comparative chart in Exhibit 5.2, since they do not have refining assets. Therefore this data is not shown.

Although crude oil prices increased significantly over this period (see Exhibit 5.2), this was in fact a higher cost into the refineries. In order to improve profits, it is essential that product prices increase at a faster pace than crude oil prices.

Exhibit 5.2 U.S. Crude Oil Composite Acquisition Cost by Refiners



Sources: EIA

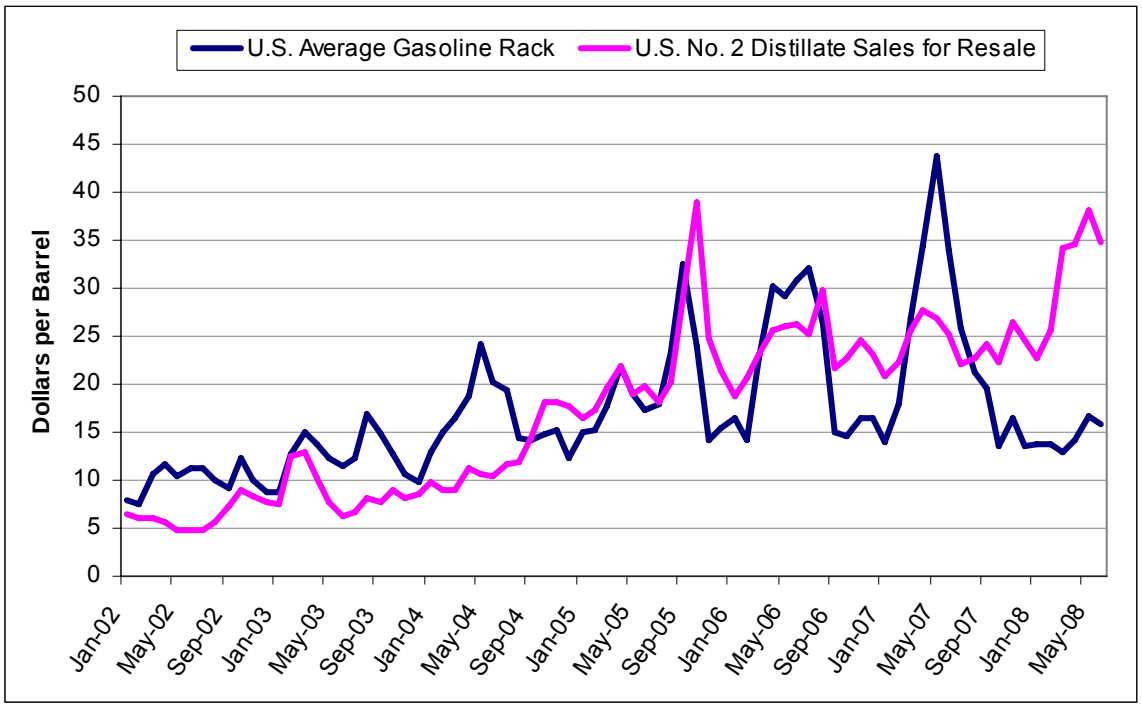
Exhibit 5.3 shows the monthly trend in the spread between U.S. average rack gasoline sales price (all grades & formulations) and average resale prices for all distillates compared to the U.S. RAC (Refiner Acquisition Cost of crude oil)[34]. This trend clearly shows the higher margin that refiner/marketers enjoyed over the period, which would directly impact profits.

Therefore the reason the downstream profits increased was because the price of refined products increased substantially more than crude oil. This was due to tight global refining capacity coupled with higher demand for all refined products. The margins peaked in 2005 and 2006 due to sustained demands and the impact of Gulf Coast hurricanes and a period of multiple refinery outages due to planned and unplanned shutdowns. Conversion to lower sulfur levels in gasoline and diesel fuel also required planned shutdown for tie-in of capital investments.

[34] This is the actual crude costs into refineries reported to the EIA for all crude processing.

In 2007 margins declined somewhat. This primarily affected refiners with a high percentage of West Coast refining capacity (Chevron and Tesoro). This downturn was prompted by weaker product prices versus crude on the West Coast.

Exhibit 5.3 U.S. Gasoline Rack and Distillate Prices vs. U.S. Crude Oil Composite RAC



Source: EIA
Note: All gasoline grades & formulations; all distillate sales

The specific 2007 results for Hawaii refiners will not be available until financial data is received and analyzed to identify results and trends from 2006. However, based on product price trends in Hawaii in 2007 and refinery operational performance indicators (Tesoro had significant operational problems in the fourth quarter of 2007), it is likely Hawaii refiner performance would have declined further from 2006.

The implications of the weak performance of the Hawaii refineries in a market where most other U.S. refineries had outstanding results is significant. With the potential for lower demand for gasoline from refineries in the U.S. (due to ethanol mandated growth and lower demands due to price and new CAFE standards), a prudent refining company would closely examine the economics and long term potential economics of these two refineries.

6 Potential Impacts of Federal and State Policies upon Supply and Pricing of Petroleum Products

The 2007 PIMAR report discussed a number of Federal and State policies and regulations that either have or potentially could impact the petroleum market in the State of Hawaii. This discussion is included in Appendix 4 in its complete format. Much of the discussion of historical changes is still correct, and the list of possible future impacts is also directionally correct.

In this section ICF will focus on several specific new policies or legislation that have been either passed or imposed since the 2007 report. These actions (which were discussed as possible actions in the 2007 report) deserve some specific discussion that the Commission and other stakeholders may wish to consider:

1. **Passage of the Federal 2007 Energy Independence and Security Act (EISA) in December 2007**

   This legislation directly impacts the petroleum market in Hawaii in two ways.

   First, the legislation mandates a significant improvement in CAFE standards for automobiles and light duty trucks, increasing from 25 miles per gallon to 35 miles per gallon by 2020. This change will, over time, result in lower gasoline consumption per mile traveled by increasing the miles per gallon for the domestic car fleet. This will contribute to lower gasoline demands than would otherwise have occurred over the period.

   Second, the EISA increases the required use of ethanol in the U.S. fuel supply in the Renewable Fuel Standard (RFS) originally promulgated in the Energy Act of 2005. This change requires an increase in biofuel usage in the United States from roughly 7 billion gallons per year (bgy) in 2007 to 36 bgy by 2022. This legislation stipulates specific increases in ethanol usage from still non-commercial cellulosic biomass feedstocks, and overall ethanol content in transportation fuels would be roughly 20% in 2020.

   While the specific method to increase ethanol usage is not identified, current gasoline quality requirements limit ethanol content to 10% (which Hawaii is already at in the state gasoline mix). Meeting higher percentages of ethanol will require massive increases in E-85 usage (a blend of 85% ethanol and 15% gasoline basestock) which must be used only in flex-fuel ready vehicles. Alternatively, states, the EPA and the auto industry may opt to increase allowable ethanol content from 10 to 20% in normal vehicles. This is a matter for technical and scientific study due to possible impacts on valves and seals in existing vehicles.

   Regardless of the outcome, if Hawaii increases ethanol substitution for petroleum based gasoline, it will further weaken refinery margins as gasoline becomes a surplus commodity, increasingly displaced by ethanol.

2. Reduce Greenhouse Gas Emissions/Establish Low Carbon Fuel Standards:

There has not as yet been passage of Federal legislation to manage greenhouse gas (GHG) emissions. However, the new administration is likely to aggressively move to this goal. In addition, multiple states are following California's lead after the passage of their AB32 and Low Carbon Fuel Standard legislation to reduce carbon content in fuels and control carbon dioxide and other greenhouse gases.

Hawaii is also working toward this goal, as the Hawaii House passed H.B.226, which directs that Hawaii study and implement reductions in GHG emissions to 1990 levels by 2020. More specifically, the recent announcement of Hawaiian Electric (HECO) that commits to not build any new coal plants, integrate up to 1,100 megawatts of renewable energy into the power grid and convert existing fossil fuel generators to biofuels using locally grown crops, is a major initiative. This announcement is linked to the effort to create 70 percent of Hawaii's energy use from clean energy sources by 2030. Currently, the state gets about 10 percent of its energy from renewable sources.

The commitment to move Hawaii in this direction is huge, and has huge ramifications for the petroleum industry. The practical ability to implement the change being considered will certainly be studied from both technical and economic perspectives. However, assuming that this goal is in fact realized, as well as the implementation of increased ethanol use, higher CAFE standards and control of CO2 emissions from refineries, the petroleum industry impacts would include the following:

a. The reduction in use of residual fuel oil and diesel fuel for power generation will eliminate a significant outlet for Hawaii's refinery product. The alternative to sales of these products to utilities or other power generators (which amounted to over 25% of 2007 refinery output) would be to either reduce the volume of crude processed or sell the surplus fuel into the global market. Reducing crude runs would lower gasoline and jet fuel production as well, and runs could not be lowered enough to eliminate the need to export residual fuel. Practically then, if the refineries continue to operate, it will be necessary to export both residual fuel and diesel in significant volumes from the Port of Honolulu to balance supply and demand.

b. Higher ethanol usage and higher CAFE standards will drive lower consumption of petroleum based gasoline, which is an objective of these programs. The lower petroleum based gasoline demand will result in excessive supply of gasoline in Hawaii which will require either reduced crude runs or exports of gasoline to balance supply.

c. Potential Federal requirements to control CO2 combustion emissions from the refineries will necessitate that the refiners 1) purchase carbon credits; 2) invest to capture and sequester combustion CO2 emissions; or 3) reduce production of combustion CO2. Carbon credit costs and investment costs for Hawaii's refineries will be very expensive and result in poorer refinery profits unless prices of all petroleum products are increased to pass on the costs. The option to reduce CO2 emissions can most easily be met by shutting a refinery down.

d. Additional refinery cost impacts will come from changes occurring from additional reductions in sulfur level in diesel (2010) and potential reductions in residual fuel oil sulfur used for ship bunkering (not finalized as yet).

The net effect of these changes from the perspective of the Hawaii refiners may be that there is minimal outlook for a reasonably profitable future. The weak earnings in 2006 and, apparently in 2007 while other refiners were making strong income levels are a poor base to tackle some major issues that will further erode profits. The fact that current refiner profit levels in Hawaii are very poor and that the future outlook for demand for products is very weak is a significant concern. Furthermore, since potential Federal GHG reduction requirements will likely not be state-specific, Chevron and Tesoro may evaluate the option of closing Hawaii refineries to help them meet overall Federal GHG reduction targets.

ICF strongly recommends that the Commission consider the full implications of the potential closure of one or both of the refineries in Hawaii. While this may, at this time be a contingency study, it should be clear that the direction of the GHG legislation in Hawaii, the Federal EISA provisions and the recent HECO announcement are specifically focused at reducing the use of petroleum based fuels in Hawaii. The current profits of these refineries are poor, and in light of the regulatory issues noted, the question of whether or not one or both refineries will close is a question of when, not if.

[This page is intentionally blank.]

7 Future PIMAR and Report Enhancements

This segment of the report will discuss the overall PIMAR process based on the data reviewed and ICF's observation of the process. It will identify areas which should be considered to enhance the PIMAR data gathering process, and recommend other potential enhancements which the Commission may wish to suggest to the legislature and other State entities.

Report Quality Overview

The quality of analysis presented in a report such as this one is a direct reflection of the quality of data collected and the methodologies adopted to aggregate and analyze that data. ICF considers the overall quality of the data used to prepare this report to be quite good. Most of the data used for this report were reported directly by the Parties to the State under IPIR and now to the PUC under the PIMAR program. All the external sources of data used come from reputable sources such as the Oil Price Information Service (OPIS), Platts and the Energy Information Administration (EIA)

The weekly and monthly data reports submitted by the parties are crucial to meet the objectives of PIMAR, as it provides accurate information at a level of detail greater than available from any public source. During the initial reporting period of 2005 through 2007, the reporting process went through improvements that standardized the process and its interpretation and made the data more comprehensive. For example, while analyzing the data for the initial report, ICF realized that under IPIR many Parties did not report HIBOB transactions since their interpretation of the IPIR required only to gasoline transactions to be reported. The instructions issued under PIMAR have been revised with a specific directive to include HIBOB transactions. As the PIMAR process moves forward, such data gaps will be resolved, further improving the completeness and accuracy of the data.

The OPIS data, used to track retail gasoline prices, are considered standard in the petroleum industry. OPIS reports petroleum product prices for all the market in the U.S. at retail as well as wholesale level such as Rack and Bulk. The spot market prices reported by OPIS in the United States are used by many marketers as benchmarks to set their own contract prices. This is also true for data from Platt's, which has a complete global pricing database. The data from EIA is well respected by the industry and analysts alike.

ICF adopted the use of weighted average price to compare prices between different points of sale in the marketing chain and across different periods within the study period. Price comparisons across different zones, subject to different price caps, were done by comparing the spreads between the actual price and the respective price cap or other reference price such as the bulk price. These techniques are best suited for an in-depth analysis of a market such as Hawaii as it helps to normalize data across different locations and periods.

The aggregate trends derived from analysis of the data under IPIR, PIMAR and from OPIS were compared, where possible, to those obtained from Energy Information Administration (EIA) for the State of Hawaii, and were found to be similar. Such comparisons reinforce our belief that the overall quality of the data, analysis and the report is good.

However, data available with the EIA does not provide details for different islands and zones within the State of Hawaii, nor it can provide company level information (due to confidentiality reasons) which is crucial to conduct analysis that meet PIMAR requirements.

Data Issues in PIMAR

In the current report to the Commission, ICF identified some additional inconsistencies with the PIMAR data that may merit alterations in the data gathering process. These include:

1. The categories of transactions used for reporting in Form W-130 constitute the source of much confusion for both the reporting parties and ICF analysis. The Parties are currently required to report volumes (and prices) for categories as defined in the form's instructions; these categories include both component and aggregated categories (e.g., *retail residential* and *retail direct to all end users*). Please reference Exhibit 7.1.

Exhibit 7.1 Form W-130 Categories of Transaction

Category Number	Category of Transaction
1	Retail Through Company-operated Retail Outlets
2	Retail to Other End Users
3	Wholesale DTW
4	Wholesale Rack
5	Wholesale Bulk
6	Retail Residential
7	Retail Commercial/Institutional
8	Retail Industrial
9	Retail to All End Users
10	Wholesale Total
11	§486J-3(a)4 Federal Agencies
12	§486J-3(a)4 State Agencies
13	§486J-3(a)4 County Agencies
14	§486J-3(a)4 Ship Stores
15	§486J-3(a)4 Base Exchanges
16	§486J-3(a)4 Retail Dealers
17	§486J-3(a)4 Commercial Agriculture
18	§486J-3(a)4 Commercial Non-agriculture
19	Transferred
20	Exchanged
21	Distributed Used

A common reporting error occurs when a reporting party enters a value for a component category but not for the corresponding aggregated category, or vice versa. This results in volumes in the component categories not summing to the corresponding aggregated

category total. This data issue resulted in resource hours devoted to identifying the proper categories to be included to accurately capture the volume of fuels consumed in Hawaii.

Some categories are supposed to "fold" into others in very apparent relationships. For example, volumes sold under *retail residential*, *retail commercial/institutional* and *retail industrial* should be equal to the volume in *retail to other end users*, which with the volume to *retail through company-operated retail outlets* should total to *retail direct to all end users*. While a sample of 2007 data partially confirms this structure,[35] with tens of thousands data submissions each carrying a risk of reporting error, the sum of component categories typically does not match the volume reported in the aggregated categories over a substantial period of time and across reporting parties.

ICF recommends that volume and price information be collected for the component categories only. Volumes for the aggregated categories would be generated by aggregating the relevant reported component categories. This would ensure that the coverage of reporting categories is mutually exclusive, so all transactions would be captured by one and only one category. This eliminates the need to report the same volume in more than one category, thereby also eliminating potential data inconsistencies, and reduces the reporting burden on the Parties. At a minimum, the instructions for Form W-130 need to be amended to include a clear description of the structure of the transaction categories, i.e., how they "fold" into one another.

As an example, the W-130 forms do not appear to have a "roll-up" category for either transportation fuel sales or utility sales. These categories, in addition to residential, commercial and industrial, reflect key categories tracked by the U.S. EIA for identification of fuel usage in different sectors. These data will become increasingly important for managing greenhouse gas emission baselines and inventories.

The current study was hampered because it appears that diesel fuel sales to utilities were not included in the W-130 reports by the reporting parties, and these are substantial volumes based on data ultimately received from DBEDT.

2. There is a class of transaction categories called §486J-3(a)4 Customers that is not further defined in the instructions to Form W-130. The section of legislation referenced in the name of the class of category merely enumerates the types of customers with no further details. It is unclear to ICF what each of these categories represents and whether it comprises a portion of volume consumed by virtue of being the final transaction reported to the PUC

[35] A sample of 2007 data from the period, Sep. 8 to Oct. 7 of 2007, for gasoline, jet fuel, diesel and residual was extracted and analyzed to test these hypotheses. In this small sample that spans only five weeks of data, sales volumes of gasoline, jet fuel and residual satisfy the hypotheses that total sales under *retail residential*, *retail commercial/institutional* and *retail industrial* are equal to those in *retail to other end users*; total sales from *retail to other end users* and *retail through company-operated retail outlets* are equal to *retail direct to all end users*. For diesel, however, the relationships between categories did not hold. For instance, during the week ending Sep. 30, 2007, [redacted]

(e.g., *retail dealers*, *commercial non-agricultural accounts*). If it is likewise unclear to the reporting parties what these categories constitute, then there is not a "correct" way to interpret the data reported in these categories. A review of PIMAR data entry for these categories indicates no consistent use of these categories among Parties.

ICF recommends a review of these categories to more precisely define them and to identify the relationship between these categories and the volume of fuel consumed.

3. The W-130 form provides a record of weekly sales volumes and prices from reporting parties. This provides sound transaction data for each category (assuming categories are clearly delineated as noted above). However, the W-130 form also provides insight into overall disposition of products by reporting entities. The volumes reported in two of these transaction categories — *Transferred* and *Exchanged* — are difficult to interpret as it is unclear what portion of the volume within each category constitutes fuel consumption in Hawaii. In the absence of definitions for *Transferred* and *Exchanged* volumes in the instructions to Form W-130, it is likely that reporting is not consistent over time and across products, evidenced by a one-magnitude increase in monthly jet fuel *transferred* volume from June 2007 to July 2007 and zero motor gasoline volume in these categories.

   ICF recommends that these categories be specifically reviewed to ensure that clear definitions exist so that a clear view of actual fuel disposition can be developed from the PIMAR data. Key issues should include:

   Transfers:

   - Transfers should be defined. What exactly is a transfer, and how is it different from a sale?
   - Hawaii refiners report a very large volume of jet fuel "transfers" (more than half of refinery jet fuel production). The implication is that these volumes are being "transferred" to HFFC storage for airline sales (because the refiners report specific jet fuel sales in other zones). Why are these "transfer" not sales? What price does the refiner receive the transferred product, either directly or after the fact?

   Exchanges: The use of product exchanges is common in the petroleum industry. Supplier A provides product at location X for Supplier B's use, and Supplier B returns similar volumes at location Z for Supplier A's use. Usually the only money changing hands is a location differential. Exchanged volume that is received is then sold on either a retail or wholesale basis and should be included as W-130 sales in one of the report categories.

   However, the W-130 form simply asks Distributors to report exchanged volumes delivered in Hawaii. It does not indicate whether exchanged volumes are also received in Hawaii, or if the exchanged volume payback is outside Hawaii (e.g. California payback)

   The optimal design of these categories should be considered. The exchange issue is less of a problem in ICF's view because any exchange volume delivered in Hawaii to another party will be captured in that party's W-130 data. The Transfers are more ambiguous, and therefore are a higher priority to resolve.

4. Form W-110 records domestic and foreign imports of ethanol by company. A comparison of ethanol imports that originate from foreign countries in the W-110 and those shown in the EIA Company Level Imports database (which records fuel imports by country) shows what appears to be underreporting of ethanol imports into Hawaii from foreign countries in W-110. This outcome may be due to trading activities in the ethanol market, which could have obscured the origin of ethanol imports into Hawaii. Regardless, the PIMAR system must be able to pin down actual ethanol imports into Hawaii more effectively. Importing parties should be required to include the name of the importing vessel and discharge date on the W-110 form to insure full reporting.

   Furthermore, landed costs of imported ethanol from foreign countries tend to be unavailable or inaccurate. Although W-110 shows [redacted] of ethanol imported into Hawaii from El Salvador in week ending Nov. 11, 2007 and [redacted] of ethanol imported into Hawaii from Jamaica during week ending Mar. 2, 2008, the landed costs for these transactions were not available. For the weeks ending Feb. 18 and Mar. 11 of 2007, W-110 showed imported ethanol volumes that amounted to [redacted] from El Salvador and Jamaica, respectively. However, the landed costs for these transactions were only [redacted] and [redacted]

5. ICF has also identified underreporting of jet fuel imports by cross-checking EIA Company Level Imports data. [redacted] Companies should be advised that their foreign imports should match reported imports to EIA.

   Also, the landed cost of almost all jet imports is not reported. [redacted] indicates that they are not the owners of the imported barrels and hence are unaware of import cost. If [redacted] is the importer of record, they could be obligated to identify the landed cost of the imported volumes.

6. PIMAR currently requires that the Parties submit separate reports for all zones in which relevant (reportable) petroleum industry activities took place, as well as a statewide consolidated report, which is denoted by as Zone *HI*. This leaves the door open for a reporting error that essentially mirrors the one described in Item 1. The total volume reported across all zones is nearly always greater than the volume reported for Zone *HI*. The gap between the total volume reported across all zones and the volume reported for the consolidated Zone *HI* tends to increase with the number of data entries involved, indicative of an inherent risk of misreporting.

   ICF recommends the elimination of the statewide consolidated report requirement. Statewide prices and volumes would be computed using values submitted for individual zones. This eliminates a redundant and error-prone reporting requirement and ensures that statewide volumes do not underreport actual activities.

Areas of Potential Improvement

The PIMAR reporting process, initiated in May 2007, has already made improvements in the process as compared to the IPIR. The PIMAR reporting forms require the Parties to report data at a greater level of detail, to conform to requirements in HRS Ch. 486H and Ch. 486J, and in a more consistent format across the various forms.

In last year's report, ICF included a discussion of potential improvements that could be made to streamline the PIMAR system for reporting parties as well as PIMAR data users. Many of these changes have been realized or are in the process to being implemented. The Commission has undertaken the development of an automated, interactive reporting system that will impose strict data standards on the reporting parties while easing the burden of data submission, improve the security of confidential information, facilitate the efficient analysis of submitted data through improved data organization and retrieval, among others.

The development of an automated PIMAR system represents an effort to shift of time resources away from data collection and integrity issues so that reports can be developed quickly and efficiently. This will also allow Commission resources to focus more on data analysis and monitoring of the petroleum business in Hawaii. ICF has the following recommendations for further improvement of the PIMAR system.

1. A secure channel of communication should be integrated with the automated PIMAR system currently under development, to replace the cumbersome and time-consuming process of issuing a formal information request (IR) and awaiting responses from the Parties when the need for clarifications or corrections arises. The process of issuing IRs and receiving replies can take several weeks and even months. ICF recommends that each reporting party designate a point of contact for data submission, whom the PUC can contact for any clarifications. The PIMAR system will maintain a record for any such electronic correspondence.

2. Currently, categories of transaction in Form W-130 do not explicitly identify the volume of fuel used for transportation, the sector that dominates petroleum consumption. Fuel that goes to utility companies for electricity generation also cannot be identified and broken out from the overall volume. The PUC should consider a modification of the categories of transaction to so that volumes consumed in these two sectors could be identified.

Glossary

Act 78	Established the Petroleum Industry Monitoring, Analysis, and Reporting Program and Special Fund; indefinitely suspended maximum pre-tax wholesale gasoline price until reinstatement by Governor; prohibited unfair practices by petroleum industry.
Alkylation Unit	A refining process for chemically combining isobutane with olefin hydrocarbons (e.g., propylene, butylene) through the control of temperature and pressure in the presence of an acid catalyst, usually sulfuric acid or hydrofluoric acid. The product, alkylate, an isoparaffin, has high octane value and is blended with motor and aviation gasoline to improve the antiknock value of the fuel.
ANS	Alaska North Slope; term used to designate crude oil of that region.
API Gravity	American Petroleum Institute measure of specific gravity of petroleum products in degrees. An arbitrary scale expressing the gravity or density of liquid petroleum products. The measuring scale is calibrated in terms of degrees API; it is calculated as follows: Degrees API = (141.5 / specific gravity at 60°F) − 131.5
Barrel	A unit of volume equal to 42 U.S. gallons. Abbreviated bbl.
Branded	A specific supply arrangement with a supplier that markets a specific brand. The supplier is usually contractually obligated to sell a specific amount of product to the reseller.
Bulk Sales	Wholesale sales of gasoline in individual transactions which exceed the size of a truckload.
CAFE Standards	Corporate Average Fuel Efficiency Standards is the term used for the sales weighted average fuel economy (in MPG) for a manufacturer's fleet of passenger cars and light trucks. Enacted in response to the 1973-74 Arab oil embargo, these standards are regulated by the National Highway Traffic Safety Administration and the Environmental Protection Agency.
Company-operated Station	Retail gasoline station that sells gasoline branded by the refinery where it was produced and is owned and operated by company personnel.
Conventional Gasoline	Finished motor gasoline not included in the oxygenated or reformulated gasoline categories.
CPG	Cents per gallon.

Crack Spread	Term applied to the differential between the value that a typical refined products mix would yield, and the value of crude. The common crack spread features a per bbl reference derived of 66.6% unleaded gasoline and 33.4% No. 2 oil. The resulting average is compared to the WTI (West Texas Intermediate Crude) price for the resulting "crack spread."
Crude Oil	Raw material for refinery processing into products.
Crude Unit	The initial refining operation in which the basic cuts of fuel are distilled out of crude oil.
DBEDT	Department of Business, Economic Development and Tourism of the State of Hawaii.
Dealer Tank Wagon (DTW)	The price that the dealer pays to its supplier, usually a jobber or refiner. Dealer prices are usually higher than rack prices because they include transportation costs. A tank wagon is the actual vehicle that the supplier or jobber uses to transport product to the dealer.
Decision and Order No. 22451	A decision by the PUC on May 3, 2006 to modify the maximum pre-tax wholesale price of gasoline. It set forth gas price caps for E-10 gasoline, the PUC's publication procedures for the maximum pre-tax wholesale price of E-10 gasoline, and the continued monitoring by the PUC of matters related to HRS Chapter 486H.
Distillates	A general classification for one of the petroleum fractions produced in conventional distillation operations. It includes diesel fuels and fuel oils. Products known as No. 1, No. 2, and No. 4 diesel fuel are used in on-highway diesel engines, such as those in trucks and automobiles, as well as off-highway engines, such as those in railroad locomotives and agricultural machinery. Products known as No. 1, No. 2, and No. 4 fuel oils are used primarily for space heating and electric power generation.
Duri Crude	Heavy sweet Indonesian crude.
E-10	Gasoline that contains 10% ethanol.
EIA	Energy Information Administration, the independent data and statistics division of the Department of Energy that compiles data on petroleum supply and demand on a weekly and monthly basis. These figures are not as timely as API statistics, but are considered more accurate.

Ethanol	An alcohol which is most often derived from corn. Ethanol is designed to be blended with gasoline to produce a cleaner burning fuel, and is an accepted oxygenate component for the oxygenated seasons mandated by the EPA.
Fluid Catalytic Cracking Unit	The refining process of breaking down the larger, heavier, and more complex hydrocarbon molecules into simpler and lighter molecules. Catalytic cracking is accomplished by the use of a catalytic agent and is an effective process for increasing the yield of gasoline from crude oil. Catalytic cracking processes fresh feeds and recycled feeds.
FOB	Terms of a transaction where the seller agrees to make the product available within an agreed-upon time period at a given location. Literally means free on board. Does not include any transportation costs or excise and duty.
HIBOB	Hawaii Blendstock for Oxygenate Blending. A gasoline blendstock that is lower in octane level and in vapor pressure than conventional gasoline. Blended with ethanol to make E-10.
HSD	High Sulfur Diesel Fuel (>500 ppm sulfur).
Hypermarketer	Large retail stores and/or supermarkets which have a gasoline offering in their parking lots, perhaps as a loss leader. Also referred to as “big box” retailers.
Import Parity	The market-based cost of landing imported petroleum products which includes all source, transportation, and handling costs.
Jet Fuel	A refined petroleum product used in jet aircraft engines. It includes kerosene-type jet fuel and naphtha-type jet fuel.
Jobber	Someone who purchases refined products at the wholesale level and then transfers or resells the product at the retail level. The retail level sale/transfer can occur at facilities owned by the jobber, independent dealers or commercial accounts.
Landed Crude Cost	The price of crude oil at the port of discharge, including charges associated with purchasing, transporting, and insuring a cargo from the purchase point to the port of discharge. The cost does not include charges incurred at the discharger port (e.g., import tariffs or fees, wharfage charges, and demurrage).
LSD	Low Sulfur Diesel Fuel (between 15 ppm and 500 ppm sulfur).
Midgrade Gasoline	Gasoline having a road antiknock index, i.e., octane rating, greater than or equal to 88 and less than or equal to 90. Typically 89 Rd in U.S. markets.

Naphtha	Refined or partly refined light distillates that are blended further or mixed with other materials, they make high-grade motor gasoline or jet fuel. Also, used as solvents, petrochemical feedstocks, or as raw materials for the production of town gas.
NYMEX	New York Mercantile Exchange.
Octane	A number used to indicate gasoline's antiknock performance in motor vehicle engines. The two recognized laboratory engine test methods for determining the antiknock rating, i.e., octane rating, of gasolines are the Research method and the Motor method. To provide a single number as guidance to the consumer, the antiknock index (R + M)/2, which is the average of the Research and Motor octane numbers, was developed.
OPIS	Oil Price Information Service. OPIS focuses on reporting U.S. rack and spot market prices, publishes reported prices at multiple U.S. terminals.
Petroleum Administration for Defense Districts (PADD)	Five geographic area into which the United States was divided by the Petroleum Administration for Defense for purposes of administration during federal price controls or oil allocation. PADD V includes Hawaii, Alaska, Washington, Oregon, California, Arizona and Nevada. Most energy data are reported on a PADD level basis.
PIMAR	Established under Act 78, the Petroleum Industry Monitoring, Analysis, and Reporting Program was created to monitor and report on Hawaii's oil industry.
Platts	Oil price information service that tracks U.S. and global pricing transactions. Platts quotes are judged reliable benchmarks for contractual transactions.
Premium Gasoline	Gasoline having a road antiknock index, i.e., octane rating, greater than 90. Typically either 93 Rd or 92 Rd in U.S. markets; Hawaii Premium is 92 Rd.
Parties	Companies affected by the PIMAR and/or gasoline price cap legislation.
PUC	Public Utilities Commission, the agency charged with the oversight of regulated utilities in the State of Hawaii. The PUC Transaction database refers to purchases and sales data submitted to the PUC by oil companies.
Rack	Petroleum products sold at the wholesale level from primary terminal storage. Refers to loading racks where tanker trucks fill up.

RBOB	Reformulated Gasoline Blendstock for Oxygenates Blending.
Ratable	Relatively consistent volume over a period of time.
Refiner Acquisition Cost (RAC)	The cost of crude oil, including transportation and other fees paid by the refiner. The composite cost is the weighted average of domestic and imported crude oil costs. *Note*: The refiner acquisition cost does not include the cost of crude oil purchased for the Strategic Petroleum Reserve (SPR).
Refinery	An installation that manufacturers finished petroleum products from crude oil, unfinished oils, natural gas liquids, other hydrocarbons and oxygenates.
Refinery Utilization Rate	Represents the use of the atmospheric crude oil distillation units. The rate is calculated by dividing the gross input to these units by the operable refining capacity of the units.
Regular Gasoline	Gasoline having a road antiknock index, i.e., octane rating, greater than or equal to 85 and less than 88. Typically 87 Rd in U.S. markets.
Residual Fuel	A general classification for the heavier oils, known as No. 5 and No. 6 fuel oils, that remain after the distillate fuel oils and lighter hydrocarbons are distilled away in refinery operations. It is used in steam-powered vessels in government service and inshore power plants. No. 6 fuel oil includes Bunker C fuel oil and is used for the production of electric power, space heating, vessel bunkering, and various industrial purposes.
RVP	Reid Vapor Pressure; used to measure pressure in terms of pounds per square inch (psi). In terms of gasoline, RVP is used as an ozone control mechanism.
Ship Bunkering	The act or process of supplying a ship with fuel.
Spot	A deal for supply at an agreed point in time wherein the price is negotiated between the buyer and the seller, and the supply commitment varies.
Spot Market	The prevailing cost to buy or sell a given petroleum product in the near future. Since this market reacts quickly, and is an alternative to wholesale sales, it provides a good indication of the direction of wholesale price trends.
Sweet Crude Oil	Type of crude oil characterized by its low sulfur content and relatively high yields of high-value products such as gasoline, diesel fuel, heating oil, and jet fuel. Due to its liquidity and price transparency, the NYMEX sweet crude oil futures contract is used as a principal international pricing benchmark.

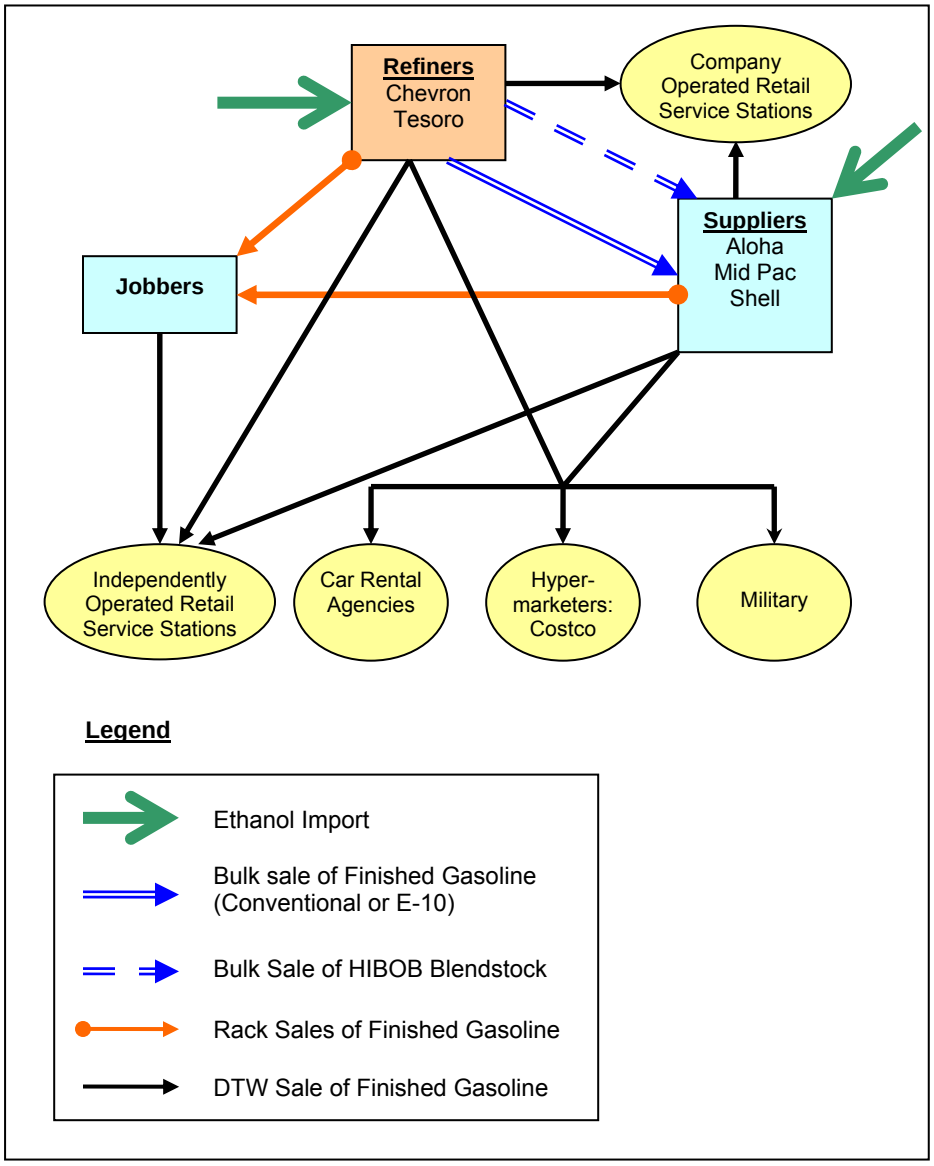
Terminal	A facility used primarily for the storage and/or marketing of petroleum products, which has a total storage capacity of up to 500,000 barrels or more and/or receives petroleum products by tanker, barge, or pipeline.
ULSD	Ultra Low Sulfur Diesel fuel (<15 ppm sulfur).
Unbranded	A supply arrangement with a supplier that is usually not contractual, and does not usually guarantee a specific amount of supply.
USGC	U.S. Gulf Coast.
West Texas Intermediate (WTI)	A light sweet crude oil produced in the United States, which serves as a benchmark grade on the NYMEX.

Appendix

Appendix 1: Gasoline Supply Chain in Hawaii

The gasoline supply chain is depicted in Exhibit 3.1 and presented again below. Chevron and Tesoro market the gasoline from the refineries in several channels. The first channel is Bulk sales to major suppliers. These are volumes of either HIBOB blendstock or blended E10 gasoline sold to Aloha, Mid-Pac and Shell in various zones. Chevron and Tesoro receive large volume commitments from the suppliers to buy the gasoline each month, and these long-term commitments are typically at negotiated prices that are designed to simulate the price that the buyers could alternatively import gasoline into Hawaii (i.e. “import parity”). The contracts are different with each party. Acquisition of the gasoline from the refiners represents the sole source of supply for Aloha, Mid-Pac and Shell; the price represents the “cost” basis for all rack and DTW sales transactions for these parties.

Exhibit A.1 Hawaii Gasoline Supply Chain



The second channel of sales is DTW (dealer tank wagon) sales to retail service stations or other resellers (e.g., the military, hypermarketers, car rental agencies, etc). DTW sales are transactions where the supplier delivers gasoline directly to the service station and the service station pays for the delivered gasoline. The DTW price represents the revenue point for the supplier's gasoline sale and the cost point to determine retail service station margins. The DTW price to other resellers may be different from the service station price (usually lower) because the other resellers are typically not branded company service stations and hence have a lower cost to the supplier for providing product. Both refiners and suppliers sell gasoline on a DTW basis in Hawaii.

The third channel of sales is rack sales. These sales represent the transaction price between a refiner/supplier and the jobber. The jobber will have his own or chartered trucks which can pick

up gasoline at a refiner/suppliers terminal loading rack and deliver that gasoline into his own tankage or a customer's tankage. The rack price represents the revenue point for the refiner/marketer for this channel of sale and the cost point for the jobber. Rack prices are generally lower than DTW prices since the jobber is picking the product up at the terminal rather than having the refiner/supplier deliver the fuel. The jobbers will resell the product on a DTW basis to their customers; the DTW price less the rack acquisition price represents the jobber margin.

The fourth channel of sale is sales through company owned and operated stations. These are retail sales which were not part of the Gas Cap legislation. Refiners and suppliers own the site and the station, and use company personnel to operate the facility. There is no wholesale transaction between any party prior to the final retail sale of the gasoline to the consumer at the pump. Consequently, the revenue point for this sale is the price consumers pay at the pump (including all taxes) and the cost point is either a) the refinery raw material costs or b) the supplier's acquisition cost for gasoline from Tesoro or Chevron.

The conversion to using 10% ethanol in gasoline in April 2006 did not impact the fundamental channels of sales described above. However, the use of ethanol in gasoline created a separate, parallel supply chain which must be managed to insure that gasoline deliveries to service stations in zones marketing E-10 (all but Zones 5 and 6) have 10% ethanol, and that the gasoline meets all other specifications. This supply chain involves importing ethanol into Hawaii and redistributing to terminals in other zones for blending into the HIBOB product now manufactured at the two refineries. This supply chain must be sustained by periodic ethanol cargoes and redistribution in barges taking care to keep the ethanol separate from the HIBOB product until being loaded into the service station delivery truck.

DTW Customer Classes

Most gasoline sold at the wholesale level in Hawaii is transacted on a dealer tank wagon (DTW). Most companies buying gasoline on said basis are typically receiving deliveries of gasoline in volumes at or under 9,000 gallons per transaction[36]. Most of the DTW customers are retail gasoline service stations that buy gasoline from the jobbers or suppliers and pay the prevailing wholesale price on that day. However, the DTW customers also include some large volume customers such as the military, hypermarketers such as Costco, and car rental companies that buy gasoline through DTW transactions but pay a price based on negotiated long-term contracts.

In an open market, most parties selling gasoline to service stations will adjust their DTW price as their acquisition cost changes, and to maintain a pricing strategy versus other retail gasoline stations in the local marketing area. In Hawaii, large DTW customers (non- service stations) often buy gasoline under contracts with large volumes and long-term commitments. In addition, unlike branded retail outlets, the oil company does not have marketing costs (for example, advertising, station maintenance, property costs, etc) associated with such sales, and will typically be charged a lower DTW price than retail branded service stations. Consequently, it is important to distinguish between the different categories of DTW customers because the prices received by the service stations are the highest and influences what the individual consumers

[36] The largest tanker truck delivering fuel products in Hawaii is about 9,000 gallons; many delivery trucks are smaller than this. In addition, one truck may deliver multiple grades of gasoline at one or more locations, resulting in multiple transactions from one delivery.

pay at the pump. Therefore, the DTW transactions for Costco, the military and car rental agencies are separated and analyzed independently to enable a clear analysis to be made of each channel of DTW sale.

After separating out the transactions for large volume customers, the remaining transactions are categorized as ‘service station’. In fact, this category might contain some other end-users such as transportation fleet operators or marine excursions outfits. It is not possible to clearly delineate all end-users from service stations based only on their name since IPIR and PIMAR data do not distinguish them. There are very few transactions involving these end-users, which acquire small volumes of gasoline at prices are comparable to those received by service stations. Therefore, these other users have been left in the service station category for the purpose of this analysis.

Appendix 2: Impact of Gas Caps and Gasoline Market Issues in Hawaii

The Impact of the Gas Caps

The use of gas caps to control the wholesale price of gasoline resulted in a significant amount of turmoil in the gasoline market in Hawaii for consumers, refiners, suppliers, jobbers and service stations.

Did the gas caps achieve the goal?

The goal was to provide a market based wholesale price cap that would modify Hawaii gasoline prices based on a mainland benchmark plus freight adjustment, with a fixed marketing and zone margin. The gas cap process controlled prices, and the oil industry complied, however it did not necessarily provide true market based pricing.

Was it worth it?

The start of the gas caps coincidental with the U.S. market's roiling from hurricanes created extreme volatility in Hawaii prices. Many consumers and market participants tried to "time" gasoline purchases or sales based on the PUC's weekly publication of the following week's gas caps. This upset the supply chain and created some outage issues. The fact that the gas cap calculation was based on mainland prices, and refiner/supplier commercial agreements were on a different basis created some significant fluctuation in supplier margins (higher) solely due to the gas cap formula. The use of "high trucking costs" in the gas cap zone adjustment calculations allowed most suppliers and jobbers to price higher in each zone than their actual cost of trucking[37].

Based on the fact that gas cap proponents and critics mutually agreed to a gas cap suspension with a PIMAR process put in place to monitor gasoline prices indicates that the general view was that the gas caps may not have been the best solution.

What happened after gas caps were suspended?

Market prices decline in the summer of 2006 and through the fall. In this period, prices for regular gasoline from suppliers and jobbers also declined, but lagged the overall global market. In this period, continuation of gas caps (as modified by Decision and Order No. 22451) would have resulted in lower prices to consumers. In the spring of 2007, as global market prices increased significantly, prices from suppliers and jobbers also increased, but also lagged the global market. In this period, the continuation of the gas caps would have resulted in higher prices to consumers. Overall, wholesale prices to retail stations may have been lower by $0.05-$.10/ gallon had gas caps been continued. The savings would have been passed on to the retail consumer only if retail margins had stayed at the levels actually seen.

[37] This was necessary to allow some jobbers who supplied outlying locations to remain profitable. Exclusion of these jobbers from the Gas Cap law was not in the PUC's authority.

As noted earlier, prices for premium and midgrade gasoline have increased more than regular gasoline when gas caps were suspended. Data indicate that Hawaii consumers have not reduced their purchases of higher octane grades through mid-2007.

Gasoline Market Issues

A significant portion of the Hawaii refinery gasoline supply is marketed through the three major suppliers and the jobbers. This arrangement is not unlike other regions in the U.S. where several refineries may supply a region, and large scale suppliers may receive product from those refineries on purchase or exchange terms. However, the Hawaii market does have some significant differences beyond that similarity:

1. The number of participants in each zone in Hawaii is relatively small. This situation stems from the overall low level of gasoline demand in Hawaii and its geography, since it is difficult for jobbers to be competitive with markets spread over islands (jobbers in mainland markets can operate in multiple counties much more easily). Even the major suppliers do not have operations in all zones.

2. If a supplier (non-refiner) wanted to increase market share in most mainland markets, they could buy additional product on the spot market to supply into their system and find multiple refiners interested in selling to them. In Hawaii, the suppliers, and also the jobbers, appear to have no options, or incentives, to increase market share. If, for example, Shell wanted to increase revenue by selling more gasoline during periods where their margins are high, reducing their price versus other companies would result in a situation where they would exceed their contracted volume commitment from the refinery supplying them. There is no viable option to get more product from the refiner, and importing gasoline into Shell tankage in Hawaii to support higher sales may create conflict with a refiner who is supplying them contract product in Hawaii. (On the mainland, Shell could simply purchase spot gasoline to support the additional demand need). This issue essentially restricts competitive supply at the wholesale level in Hawaii.

3. While there is capability for Aloha, Mid-Pac and Shell to import gasoline into Hawaii, there are several obstacles.

    a. One is that the party importing gasoline could jeopardize their supply contract with a refiner by attempting to increase market share. In Hawaii's closed market, incremental gasoline imported into Hawaii means either reducing crude runs or exporting surplus gasoline, which clearly impacts refiners.

    b. Two is that following the ethanol mandate, the importer would be required to arrange the import of a HIBOB type product suitable for ethanol blending. It may be possible to arrange this, but it does make it more difficult than the prior alternative of simply buying spot market gasoline for Hawaii.

    c. The suppliers may not really have any incentive to import, as long as they feel they are buying product from the refiners at competitive market prices. Attempting to increase market share by importing will tend to drive prices down, jeopardize supply contracts, and likely not net more income.

As the gasoline analysis indicates, it appears that the suppliers are getting competitive market prices from the refiners for their supply. Supplier margins are well above mainland markets, as are retail service station margins. The situation as it is appears favorable to all parties.

4. Jobbers in Hawaii are also much more limited in finding competitive suppliers of gasoline than mainland markets. A jobber in, for example, Atlanta, may have as many as 15 different potential refiner/suppliers to negotiate with for supply of product, either as an unbranded buyer or as a branded distributor for the refiner/supplier. In Hawaii the choices are much more limited. If a jobber wanted to consider switching from (for example) Chevron to Mid-Pac as a supplier, Mid-Pac may have to go to Chevron (or Tesoro) to secure the additional gasoline supply for the jobber.

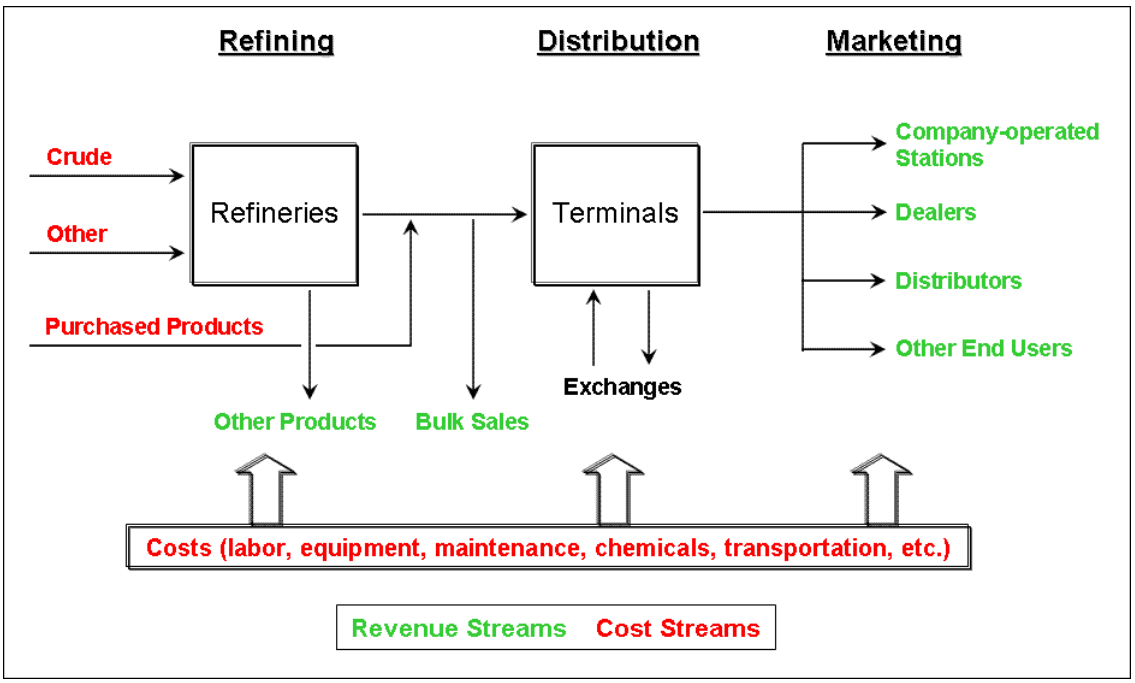
5. The existing infrastructure in Hawaii makes it virtually impossible for an outside party to enter the market, short of an acquisition such as Mid-Pac's purchase of ConocoPhillips assets. The market cannot realistically support additional refineries or additional suppliers or jobbers without reducing volumes even further for the existing parties. This would decrease scale, adversely affect margins for all parties and create inefficiencies.

Appendix 3: Profit Analysis Business Models

Refiner/Marketer Business Model

Exhibit A.2 shows a typical, simplified business model for a refiner/marketer. The party purchases and refines crude oil and other feedstocks, produces mainline fuel products, and sells the products in a terminal & distribution system. The sales can take place on a bulk basis FOB the refinery, or through a network of owned service stations, franchise dealers, or distributors. The refiner/marketer will often buy and sell product in the spot market to manage system inventories and optimize logistics and distribution costs. Expenses are incurred throughout the system to operate refineries, terminals, etc as well as to manage the business.

Exhibit A.2 U.S. Downstream Refiner/Marketer Supply Chain



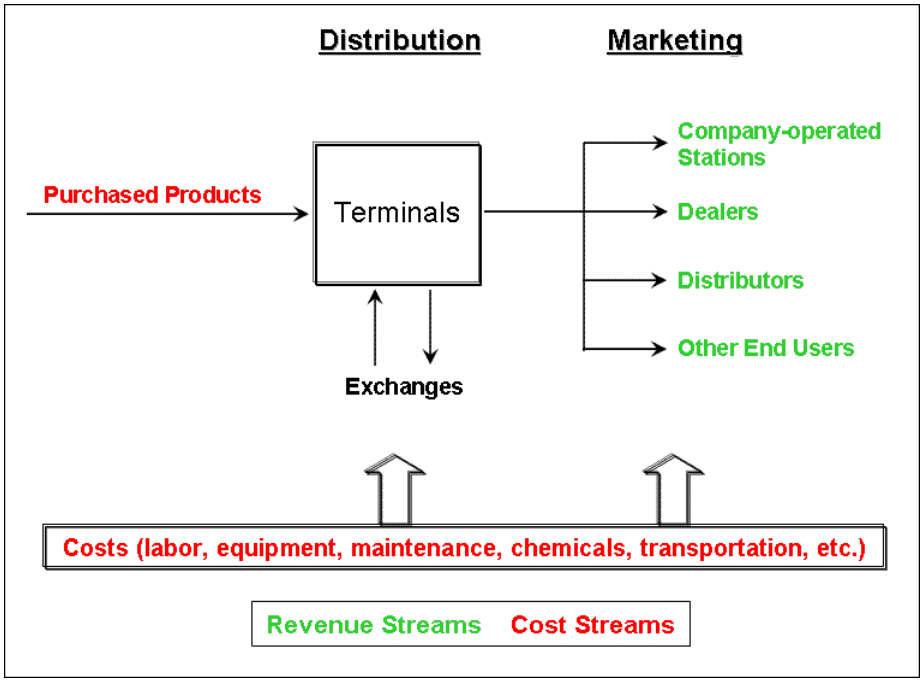
Supplier/Marketer Business Model

In Hawaii, Aloha, Mid-Pac and Shell have a different business model than the refiner/marketers. These companies do not have refineries, and their business is driven solely by purchasing product from the refineries or importing and reselling it primarily to service stations and a small portion to jobbers. Their purchases are negotiated with the refiners on a term basis, and the price that is paid is an agreed price that represents an approximation of import parity. In other words, Chevron and Tesoro negotiate with the suppliers to provide them a price for product which is market competitive with imported gasoline, thereby insuring that the suppliers will not import gasoline to meet their needs..

There are only a few companies on the mainland who have a similar business model to Aloha, Mid-Pac and Shell. Companies such as Quiktrip, Wawa, Pilot, and Gulf Oil will buy product on a

bulk basis and ship (typically via pipeline) to terminals for delivering on a DTW basis to their service stations and dealers (see Exhibit A.3). Each of these companies are not public, therefore their financial and volume data are not visible. However, they are making money similar to the Hawaii suppliers. The key difference between Hawaii and Mainland business models is that the suppliers on the mainland are not restricted in buying product from a single refinery.

Exhibit A.3 U.S. Downstream Supplier/Marketer Supply Chain



Suppliers on the mainland have options to buy bulk pipeline barrels from multiple refiners or traders, and also can buy product at multiple terminals on a rack basis, and then resell the product. Hawaii suppliers are limited to purchasing product from either Chevron or Tesoro, and the option of "switching" suppliers to get a better purchase arrangement is virtually impossible since the "other" refiner would have to get out of term contracts with one or both other buyers at the same time to have volume to sell.

This fact and the lack of a "readily available" spot market means that the Hawaii suppliers have no incentive to lower their price to gain market share, or to add new service stations to earn more income, because they cannot secure more product. This is not the case in the competitive mainland market. Hawaii supplier margins therefore are essentially "set" by their purchase price (dictated by negotiations, and determined by market prices in other regions (Far East, U.S. etc), and the DTW prices in their sales channels. The service station DTW channel is set by the competitive market in Hawaii, and the suppliers' price consistent with their individual marketing strategies versus the other DTW sellers (including Chevron and Tesoro). They have no incentive to change their pricing profile, or lower price unless it is simply to follow the "leaders" price down to preserve their sales volumes.

Appendix 4: 2007 PIMAR Report on the Potential Impacts of Federal and State Policies upon Supply and Pricing of Petroleum Products

The petroleum market in the State of Hawaii has been impacted by existing state and federal policies in many areas. Several recent policy impacts have included:

State:

a. The implementation of gasoline price caps in 2005, and suspension of the price caps in 2006

b. The implementation of a 10% ethanol requirement in 85% of gasoline sold in Hawaii

c. The implementation of the Petroleum Industry Monitoring and Reporting program (PIMAR) in 2007

Federal:

d. The phased reduction in sulfur level in gasoline, from 300 ppm in 2005 to 80 ppm in 2006. The regulation requires refiners to produce gasoline at a maximum of 30 ppm sulfur in 2007.

e. The reduction in on-road diesel sales to 15 ppm beginning in 2006

These changes have resulted in material impacts to the petroleum market in Hawaii. In order to meet the State legislation's requirements, refiners and other suppliers have been required to comply with controls on gasoline prices, and been required to modify their terminal, transportation, and service station equipment due to the ethanol legislation. Ethanol imports and purchase contracts have been necessary to acquire the ethanol for usage in Hawaii.

Federal policies on lower sulfur levels in gasoline and diesel have required refiners to invest capital in the refineries, or to purchase lower sulfur ('sweet') crude oils in the global market to control the sulfur level in products. Both of these options increase the cost of manufacturing products. The purchase of additional sweet crude oil directionally increases the refiners cost of supply, since these are premium crudes on the world market. Capital investment to extract additional sulfur in the refining process is very expensive, and particularly so for smaller refineries due to the smaller scale of their business.[38] Based on discussions with the Commission, ICF will limit the analysis of state and federal policies (etc) to future known and proposed policies, rules and regulations, with the existing legislative structure as a "base" industry market. Due to its pertinence to Hawaii, ICF will also review the apparent impact of the ethanol mandate in Hawaii, and discuss the potential impact of the new PIMAR process on the market in Hawaii.

With this assumption, ICF has identified the following policies, rules and regulations which could impact Hawaii petroleum supply and pricing.

[38] Building a larger hydrotreater is less expensive per barrel of throughput capacity than building a smaller one. In most cases small refineries would only be able to utilize a smaller hydrotreater, and therefore would have a more difficult time justifying an investment.

1. Hawaii Ethanol mandate implementation (April, 2006)

The implementation of the ethanol mandate in April 2006 required both of Hawaii's refineries to modify their process operations to be able to produce a suitable gasoline blendstock (called HIBOB: Hawaii Blendstock for Oxygenate Blending). The blendstock is required to be shipped to terminals separately from ethanol due to ethanol's water affinity. HIBOB and ethanol are blended at the terminals directly into service station or consumer delivery trucks.

The need to manufacture HIBOB and keep ethanol separate required refiners as well as suppliers and jobbers in Hawaii to invest in the distribution infrastructure to modify tankage, piping, valves, barges, and other equipment to prepare for the implementation of gasoline sales with 10% ethanol. These costs were estimated by the Parties to be about $35 million. Since Hawaii has no in-state ethanol production, refiners and suppliers have had to purchase ethanol and import the ethanol into Hawaii, often from the Caribbean at a significant cost.

The ethanol mandate has allowed Hawaii to participate in the movement to increase alternatives to traditional petroleum-based supply, however it is unclear at this point if consumers have benefited. The added supply from ethanol into Hawaii increases gasoline supply (which directionally should reduce prices); however the refiners may be compensating by exporting more gasoline, or gasoline components to balance supply and demand. With refiners and others heavily invested in the ethanol infrastructure, they will attempt to recoup their higher costs of business and investment (which the revised gas cap formula in Act 78 would have allowed them to do).

In summary, the implementation of the ethanol mandate by all impacted parties appears to have been a technical success; however the original goal of the ethanol mandate to stimulate in-state ethanol production has not as yet been achieved. Moreover, the process to produce and distribute gasoline in Hawaii has now become a dual supply chain, one for gasoline blendstock (HIBOB) and one for ethanol, and has fragmented the existing terminal storage capacity to some extent since ethanol tanks need to be maintained for dedicated usage.

2. Implementation of the Petroleum Industry Monitoring, Analysis and Reporting (PIMAR) Act

The implementation of the PIMAR act is currently underway through this report, the companion report on gasoline pricing, and the ongoing development of a data reporting process from the parties involved in the oil business in Hawaii. The goal of the PIMAR process is to provide Hawaii consumers and legislators with a perspective on petroleum product prices and supply in the state of Hawaii, and to provide vigilance on the oil industry so that any aberrant behavior involving pricing or supply actions can be identified.

The current development of the PIMAR process is still evolving. There is a significant amount of information required to monitor the oil industry and insure that all data being reviewed (prices as well as volumes) are being consistently reported by all impacted parties. It is anticipated that the overall quality of the monitoring will improve with time as parties

become familiar with the process, databases are developed, procedures are further refined, and report content is stabilized.

The advantages of the PIMAR program are that:

a. Consumers and Legislators will better understand price trends in Hawaii, and the rationale for price increases or decreases

b. Margin levels of refiners, suppliers and jobbers can be evaluated over time to identify periods of high and low margin performance

c. Refiners, suppliers and jobbers will understand that their prices and actions (imports, exports, inventory, refinery runs, etc) are being monitored, and that any aberrant actions in the marketplace will be visible.

These advantages will promote a healthier understanding between business and consumers, although the reporting process and procedures may take several years to iron out data issues as well as to rationalize and explain industry actions to the public. It is unlikely that the PIMAR process will affect petroleum product supply in Hawaii; however it could have an impact on prices if the future visibility of price actions and market comparisons impacts price decisions by refiners, suppliers or marketers.

There is a risk that the PIMAR process may inhibit some industry participants from attempting to enter the Hawaii market and increase competition due to the reporting requirement and potential threat of additional regulation.

3. Reduce the sulfur level in diesel fuel sold for off-road use to 15 ppm (parts per million) by 2010–2012

Beginning June 1, 2007 the sulfur content of off road diesel, marine diesel and locomotive diesel will be reduced to 500 ppm. On June 1 2010 off-road diesel sulfur content will be reduced to a maximum of 15 ppm (ULSD). The sulfur content of locomotive and marine diesel fuel will be reduced to 15 ppm beginning June 1, 2012. (Law is in place)

In 2006 (June), the Federal law for on-road diesel fuel changed from 500 to 15 ppm. The law for off-road diesel is currently 5000 ppm. This change in off-road sulfur levels will ultimately require all diesel sales in Hawaii to be at the 15 ppm level. The impact of this change will be that refiners will need to determine the most economic means to comply with the new law. The economics of the various options they have will depend on several factors, including a) their base sales of off-road diesel; b) costs to install hydrotreating capacity to reduce the sulfur level of off-road diesel produced; c) costs to alter the crude slate to process even sweeter (lower sulfur) crude oils and d) costs to export higher sulfur diesel fuel and import diesel fuel with 15 ppm sulfur or lower.

The change in 2006 for on-road diesel required Chevron to stop producing on-road diesel in Hawaii since their refinery does not have the processing capability to reduce sulfur levels sufficiently to meet the on-road sulfur requirements. As the Federal policy moves to lower sulfur for off-road sales in 2010, it may require further refinery operational changes and/or

possible investment to meet the new requirements. This change will make the costs of supplying product that meets sulfur requirements higher for Hawaii refiners and, ultimately, consumers.

4. Increase the mandated levels of bio-based fuels in U.S. transportation fuels (gasoline and diesel)

There are multiple bills in Congress which would increase the Renewable Fuel Standard (RFS) requirement from 7.5 billion gallons per year in 2012 to higher levels. The proposal by President Bush is to create an Alternative Fuels Standard, raising biofuel usage to 35 billion gallons per year by 2017. On June 21, 2007, the Senate passed the Renewable Fuels, Consumer Protection and Energy Efficiency Act of 2007, mandating that ethanol production grow to at least 36 billion gallons a year by 2022. Also known as the CLEAN Energy bill, it was introduced by Senate Majority Leader Harry Reid and Sen. Jeff Bingaman, D-N.M., chairman of the Energy and Natural Resources Committee.

The outcome of this legislative session is uncertain at this time. However, it is very likely that the existing RFS will be significantly raised. More uncertain will be the manner of implementation, i.e. it will be unlikely that the legislation will mandate an increase in ethanol in every state or nationwide.

The existing use of ethanol in most of Hawaii's gasoline will mitigate any future costs with terminal conversions if there is a mandate, or an economic decision to increase ethanol blending. However, there could be substantial added costs in two areas: 1) increased importing of ethanol (acquisition price may or may not be a higher cost due to ethanol market prices, and added tankage conversion may be required) and 2) additional refinery modifications and costs to modify the production quality of HIBOB to maintain finished blended gasoline quality with higher than 10% ethanol content.

5. Reduce Greenhouse Gas Emissions

The US Congress has been subjected to increasing pressure over the past 5 years to deal with the problem of Greenhouse Gas emissions (GHG). Currently there are six bills in Congress dealing with the problem. Generally speaking they are economy wide and range in severity. Two illustrative bills are the Lieberman/McCain, probably the most stringent, and the Bingaman, the one that has the most support from industry.

The Lieberman/McCain is economy wide with the exception of agriculture. Entities that emit less than 10,000 tonnes of CO_2e (t/yCO_2e) per year are exempt. Refineries, since they emit CO_2, N_2O, and CH_4 in quantities generally greater than 10,000 t/y, are subject to allowance requirements. Also under the Lieberman/McCain are all transportation fuels whether produced in the United States or imported are subject to the allowance costs. The carbon allowance values are estimated to range from $\$36.38/tCO_2e$ in 2012 when the law goes into effect to $\$73.70/tCO_2e$ in 2030. The dollar amounts are 2005 dollars.

The Bingaman bill does not have the 10,000 tonnes exemption and applies to all petroleum products. However, the Bingaman bill has a safety valve allowance cost. In other words the

allowance values may not exceed the safety valve. The latter begins at $12.00/tCO$_2$e in 2012 and escalates at 4% annually thereafter.

In addition to the Federal bills, California has passed A.B. 32, which directs a significant reduction in GHG emissions by 2020 and 2050. More significantly, the Hawaii House passed H.B.226, which directs that Hawaii study and implement reductions in GHG emissions to 1990 levels by 2020.

Unless the refineries in Hawaii can develop mitigation tactics (further energy efficiency, carbon sequestration, etc), they are likely to be severely impacted by these bills. In particular the Lieberman/McCain bill targets transportation fuels which would substantially raise the cost of refinery produced fuels and thereby cost of travel in the islands. Initial modeling has shown that the impact of the more severe bills may result in the closure of the weaker refineries in the country and an increase in product imports from those parts of the world not subject to carbon caps.

6. Institute SO_2 Emission Control Areas (SECA's), reducing the sulfur level in vessel bunkering fuel

On May 29th, 2005 Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL) regulations went into effect.[39] These requirements by the International Maritime Organization (IMO) came into effect in May of 2006. The thrust of Annex VI is to control SO_2, NOx, and VOCs in marine fuels. Also under the Annex certain areas are established as SECAs in which all main fuels (both diesel and bunkers) must have a sulfur content of no higher than 1.5%.

SECA's have already been established for the Baltic Sea and the North Sea. The US EPA, Environment Canada and the Instituo Nacional de Ecologia of Mexico have begun developing the technical data for application to the IMO in 2008 for a North American SECA. The SECA process takes approximately 5 years so a SECA is expected to be implemented in North American waters sometime in the 2012-2013 period.

Apart from the SECA process there is also a bill in Congress called the Marine Pollution Prevention Act of 2007. It was introduced into the House in February and passed in March. It is now scheduled to be voted on in the Senate. Essentially this would bring the US into compliance with Annex VI independently of the North American SECA. Under this bill all marine fuels used in the territorial waters of the United States would have a maximum sulfur content of 1.5%.

The existing SECAs have resulted in shortages of low sulfur marine fuels in Europe and also problems with the lubricants used in marine engines. The SECA regulations do give ship owners the option of either using low sulfur fuels or installing salt water scrubbers that are currently being tested on ferries plying the English Channel. Which way ship owners will opt is not yet clear. Cost and availability of the new fuels is a problem but the scrubbers are expensive and the ships also lose cargo space and tanks have to be designated for the sludge from the scrubbers.

[39] Annex VI was ratified by the Senate in April of 2006.

The IMO is also moving to reduce the sulfur content of bunkers everywhere and there is also a proposal to abandon bunkers and use only marine diesel in ships.

As part of the territorial waters of the United States, Hawaii would be impacted by both the current bill in Congress and the future SECA. The two refineries in Hawaii would have to either process the residual fuel further (a very expensive proposition) or rely exclusively on even lower sulfur crude oils, just at the time that other countries are also following this option.

7. Increase CAFE standards for Fuel Economy

There are several bills in the Federal legislature recommending significant increases in U.S. vehicle CAFE standards. CAFE standards (Corporate Average Fuel Economy) require automakers to produce and sell vehicles with a specified level of gas mileage. Increasing standards from current levels will reduce gasoline demand based on a fixed set of miles driven.

Bills are pending that were introduced this year include: 1) Improved Passenger Automotive Fuel Economy Act of 2007, introduced by Sen. Stevens, proposing an increase in CAFE standards to 40 miles per gallon (mpg) by 2017 and 2) the above noted Clean Energy Bill includes provisions to increase CAFE standards to 35 mpg by 2020. The current CAFE standard for passenger vehicles is 27.5 mpg.

Increasing CAFE standards will, over time, lower gasoline consumption per mile driven as the vehicle fleet turns over. It is not clear whether either of these bills, or a compromise, will be passed, signed and enacted in 2007, but legislators are very focused on this issue. The potential impact on Hawaii will be in the future, dependent upon the ultimate legislative ruling and vehicle fleet turnover timing. Higher CAFE standards would mean lower gasoline sales and demand over time, assuming the population base is stable, and miles driven per person is stable.

Analyzing any new law would involve assessing historical vehicle fleet turnover and population growth forecasts to project ultimate gasoline demands in the future. The impact on refiners may be a lower demand for refinery gasoline; however the tradeoff between population growth (more drivers) and higher CAFE standards may make this legislation less of a concern to refinery profitability than the other items that are suggested for study.

Summary

These are the primary legislative areas which could impact Hawaii gasoline supply and price. Other than the Federal off-road diesel issue, the Hawaii ethanol mandate, and the PIMAR process, each of these potential laws are not sufficiently defined or finalized to permit efficient analysis of the potential impact. However, several generalizations can be made:

a. Most of these laws or potential laws will increase the cost of refining petroleum crude oil into products everywhere, including Hawaii. It will also adversely affect the profitability and the profit potential of Hawaii's refineries if retail prices of products do not increase. Supply security is an issue in the event one or both refineries close.

b. The changes prior to 2007 (lower sulfur levels in gasoline and diesel; the ethanol mandate) appear to have resulted in the refineries' processing lighter (more expensive) crude oils, and exporting some unfinished products and blendstocks to manage compliance.

c. The impact of the laws may mean more imports of ethanol and low sulfur diesel, and increased exports of higher sulfur distillate components and gasoline blendstocks or naphtha. This generally would lower a refiner's margin and also result in increased marine traffic at a busy port.

d. The need to process more expensive crudes and the operational costs to meet many of the new laws will erode the profit margin of these refineries.

e. The most significant areas which are threats to supply security in Hawaii are the issues of Greenhouse Gas controls, and, to a lesser degree, the potential SECA based reductions in residual fuel sulfur level. These areas could have a dramatic impact on the viability of the refinery operation and profitability, or potentially require a level of investment which could be economically justified.

f. In order to thoroughly assess the ramifications of the laws (once defined), it would be prudent to develop the analysis in concert with the refiners and other key stakeholders. The refiners have the modeling tools to allow a thorough analysis of alternative options and costs based on the physical equipment they have on site. Other stakeholders (DBEDT, the Utility, airlines, etc) may be required to assess the "knock-on" effect on their businesses or Hawaii consumers.

g. The impact of the PIMAR process will be to provide a needed visibility to refiner and supplier decisions that impact Hawaii consumers.