In Alaska

- Three Decades Working in Alaska
- Advisors to State of Alaska’s Departments of Law, Natural Resources and Revenue
- Consulted with Alaska Legislature Regarding Petroleum Tax and Gas Development Issues
- Analyzed Competitive Issues Relating to Transportation Services, Refining and Gasoline Pricing
- Prepared Report on the State of Alaska’s Refining Industry for the Department of Natural Resources and Senate Finance Committee
Outside Alaska

- Worked with Major Oil-Producing States, Including Texas, Louisiana, New Mexico, Oklahoma and California

- Analyzed Competition in the Refinery Industry on the West Coast for the State of California

- Consulted with the Federal Trade Commission Regarding the Refinery Industry

- Worked with Producers and Refiners in the Lower 48
Topics

➤ Industry Basics

➤ Significant Challenges

➤ Product Markets and Logistics

➤ Refined Product Prices

➤ Economic Impact
Alaska’s Refineries

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Crude Throughput</th>
<th>Refined Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tesoro</td>
<td>72 MBD</td>
<td>72 MBD</td>
</tr>
<tr>
<td>Petro Star</td>
<td>82 MBD</td>
<td>25 MBD</td>
</tr>
<tr>
<td>Flint Hills (Closed)</td>
<td>87 MBD</td>
<td>26 MBD</td>
</tr>
</tbody>
</table>

Note: Approximately 70% of Petro Star and Flint Hills throughput is re-injected into TAPS as return oil.
Alaska and the U.S. West Coast are Part of “PADD V”*

* PADD stands for Petroleum Administration for Defense Districts.
Alaska’s Refineries are Part of Broader Market that Includes West Coast and Asian Refineries

- Alaska Refineries use ANS and Cook Inlet Crude Oil; ANS is also a Significant Feedstock for West Coast Refineries
- Alaska Refineries Supply Product to Alaska; West Coast and Asian Refineries also Supply Product to Alaska
- Alaska Refineries Export Heavy Products to the West Coast

Alaska (3): 97 MBD Capacity

Hawaii (2): 144 MBD Capacity

Puget Sound (5): 625 MBD Capacity

No. California (5): 817 MBD Capacity

So. California (7): 1,103 MBD Capacity
Significant Challenges Facing Alaska’s Refiners

- Small in Scale and Technologically Simple
- Inability to “Upgrade” Heavy End of Barrel; By-Product
- Demand for Largest Volume Product (Jet Fuel) Declining
- Compete in Broader Market With Declining Demand; Creates “Surplus” Capacity Among Outside Competitors
- Distant from Other Potential Markets (Distance Cuts Both Ways)
- Fuel Costs Significantly Higher Than Outside Competitors
- Few Supply Alternatives, Particularly for TAPS Refiners
Alaska Refineries are Small Relative to Typical West Coast Refineries

Note: Petro Star capacity is calculated as 30% of crude throughput capacity; ~70% of throughput is re-injected into TAPS as return oil.

Source: Petro Star; Tesoro; Energy Information Administration; Oil and Gas Journal.
Alaska Refineries are Much Less Complex Than Typical West Coast Refineries

Source: Oil and Gas Journal; Energy Information Administration; Penn World.
Product Demand in Alaska is Significantly Different Than on the West Coast

Source: Energy Information Administration, SEDS (2014).
Product Demand Has Declined on the West Coast and in Alaska Over the Past Decade

Source: Energy Information Administration, SEDS (2014).
Jet Fuel Demand is Down by Nearly Half While Demand for Other Products is Flat

Source: Energy Information Administration, SEDS (2014).
Product Movement Into and Out of Alaska

[Map showing various regions of Alaska with arrows indicating direction of product movement. The map highlights the import and export routes.]
Cost of In-State Product Movement Can Be Significant

![Map showing transportation options and costs between different locations within Alaska.]
Gasoline Prices in Alaska and Hawaii are Similar Before Addition of Retail Taxes

Source: AAA; OPIS.

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Anchorage | $3.07 | $2.99 | $2.18
Honolulu | 3.01 | 3.01 | 2.24
Seattle | 2.70 | 2.66 | 2.08

Econ One Research, Inc.
Jet Fuel Prices are Similar in All West Coast Locations

Source: Energy Information Administration.

<table>
<thead>
<tr>
<th>State/Area</th>
<th>Average (2006-2014)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>$2.61</td>
</tr>
<tr>
<td>Washington</td>
<td>2.55</td>
</tr>
<tr>
<td>West Coast</td>
<td>2.56</td>
</tr>
</tbody>
</table>

Source: Energy Information Administration.
Employment and Earnings for Alaska’s Refining Industry

- Alaska Refiners Account for Approximately 10% of Non-Seafood Manufacturing Jobs in the State
- Highly-Skilled Jobs with Average Earnings of ~ $136,000 Per Year
- Total Direct and Indirect Wages of $70 Million Annually

Source: Econ One Estimates using IMPLAN model and BLS data.
Alaska’s Refineries Contribute More than $150 Million Annually to the State’s Economy

Closure of Flint Hills Refinery Removed ~$50 Million of Economic Activity Annually

Refining Industry is Key Supplier to Military, which Accounts for $2.5 Billion Annually in Economic Activity in Alaska

Source: Econ One Estimates using IMPLAN model and BLS data.
Alaska Refineries Provide the State and Municipal Governments with Over $20 Million in Additional Revenues in the Form of Taxes and Royalty in Kind (RIK) Purchases Annually

- RIK Purchases Provide the State with ~$1.75/bbl More than Royalty in Value (RIV)
- RIK Volumes Likely to Increase

Source: Econ One Estimates.