California Transportation Fuel Overview & Crude Oil Trends

OSPR - Spill Prevention and Response Day

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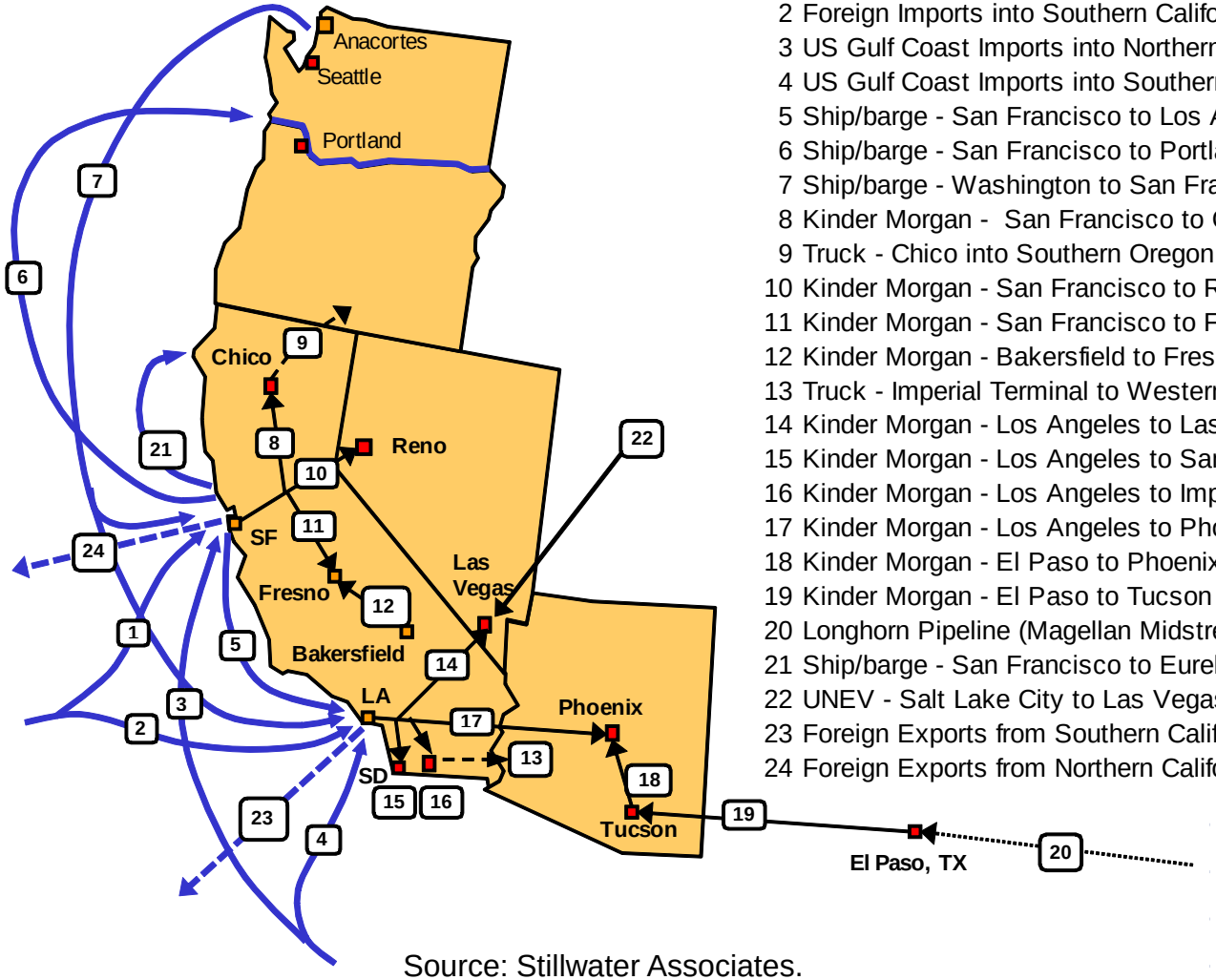
Transportation Fuel Infrastructure Overview

Fuel Infrastructure – Key Elements

- The California transportation fuel "infrastructure" consists of several interconnected assets operated by a combination of refiner and third-party companies
  - Refineries
  - Pipelines
  - Marine terminals
  - Storage tanks
  - Rail
- Crude oil and petroleum product infrastructure assets are separate and distinct from one another – not interchangeable
- Unlike with the electricity distribution system, Northern California is not directly connected to Southern California

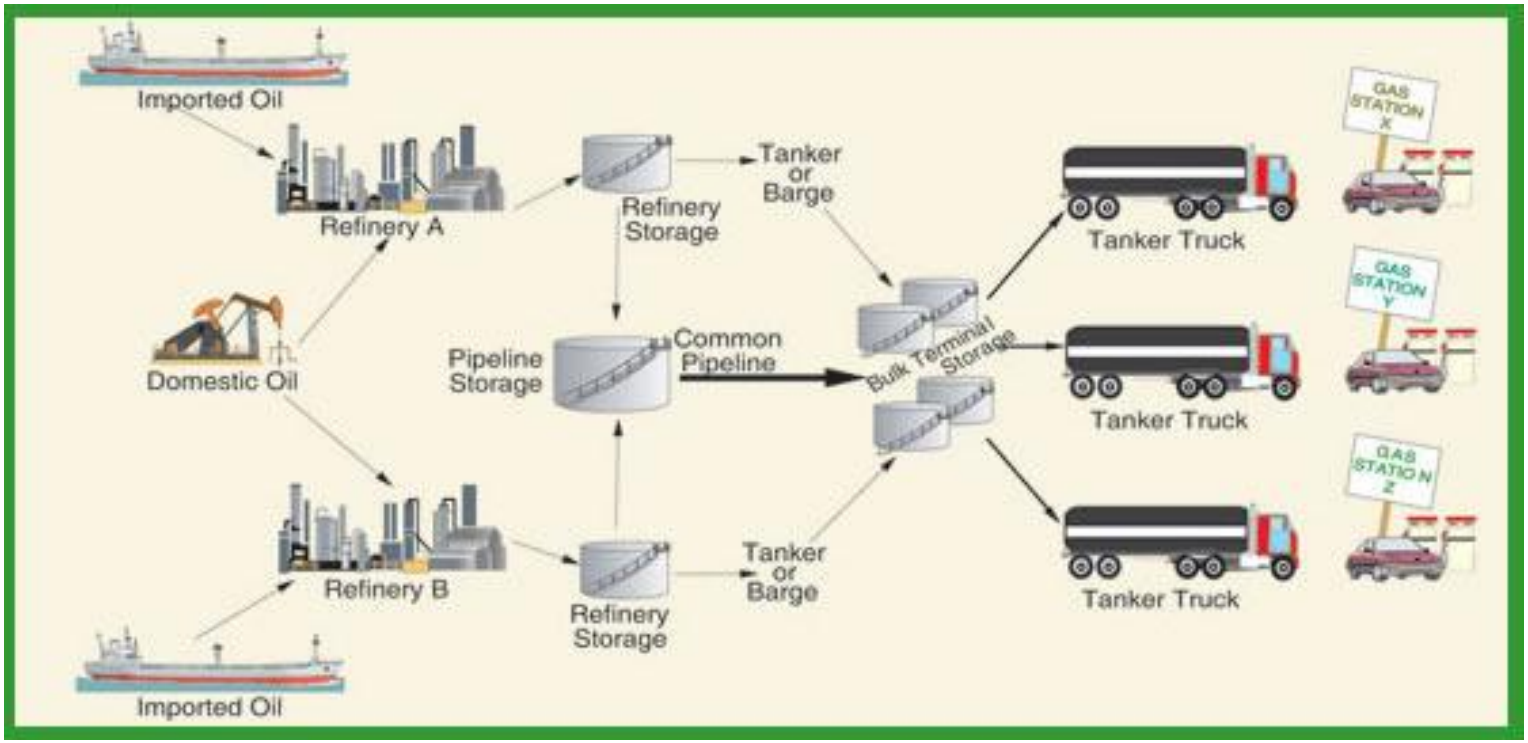
Western States – Fuel Flows



1 Foreign Imports into Northern California
2 Foreign Imports into Southern California
3 US Gulf Coast Imports into Northern California
4 US Gulf Coast Imports into Southern California
5 Ship/barge - San Francisco to Los Angeles
6 Ship/barge - San Francisco to Portland
7 Ship/barge - Washington to San Francisco and Los Angeles
8 Kinder Morgan - San Francisco to Chico
9 Truck - Chico into Southern Oregon
10 Kinder Morgan - San Francisco to Reno
11 Kinder Morgan - San Francisco to Fresno
12 Kinder Morgan - Bakersfield to Fresno
13 Truck - Imperial Terminal to Western Arizona
14 Kinder Morgan - Los Angeles to Las Vegas
15 Kinder Morgan - Los Angeles to San Diego
16 Kinder Morgan - Los Angeles to Imperial
17 Kinder Morgan - Los Angeles to Phoenix
18 Kinder Morgan - El Paso to Phoenix
19 Kinder Morgan - El Paso to Tucson
20 Longhorn Pipeline (Magellan Midstream Partners, L.P.)
21 Ship/barge - San Francisco to Eureka
22 UNEV - Salt Lake City to Las Vegas
23 Foreign Exports from Southern California
24 Foreign Exports from Northern California

Source: Stillwater Associates.

Transportation Fuel Infrastructure

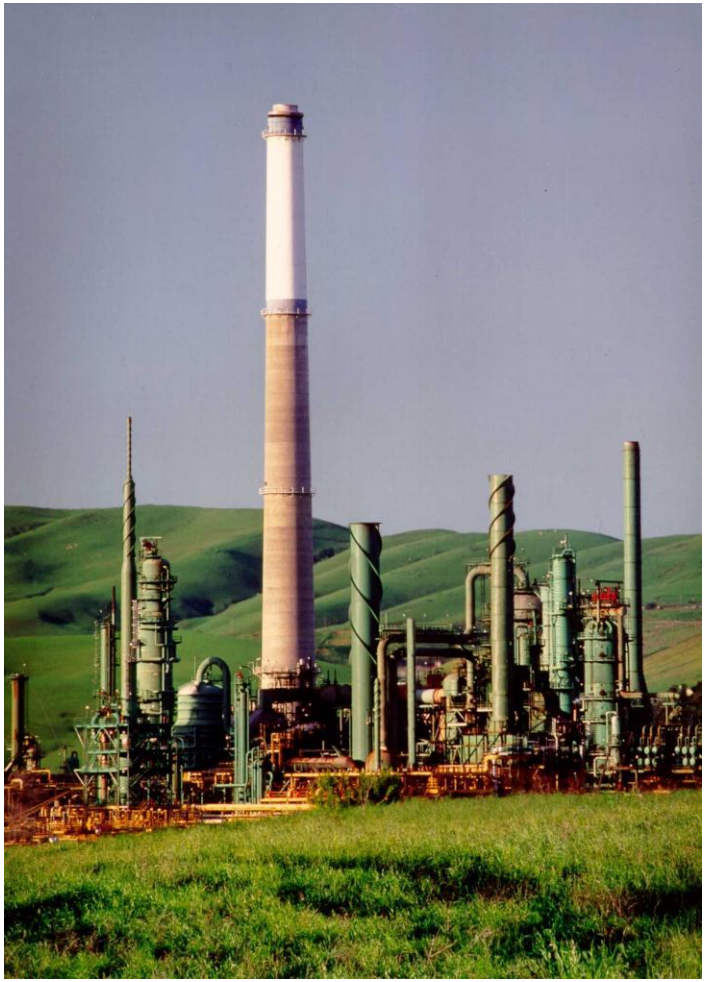


Source: Energy Information Administration

Key Elements - Refineries

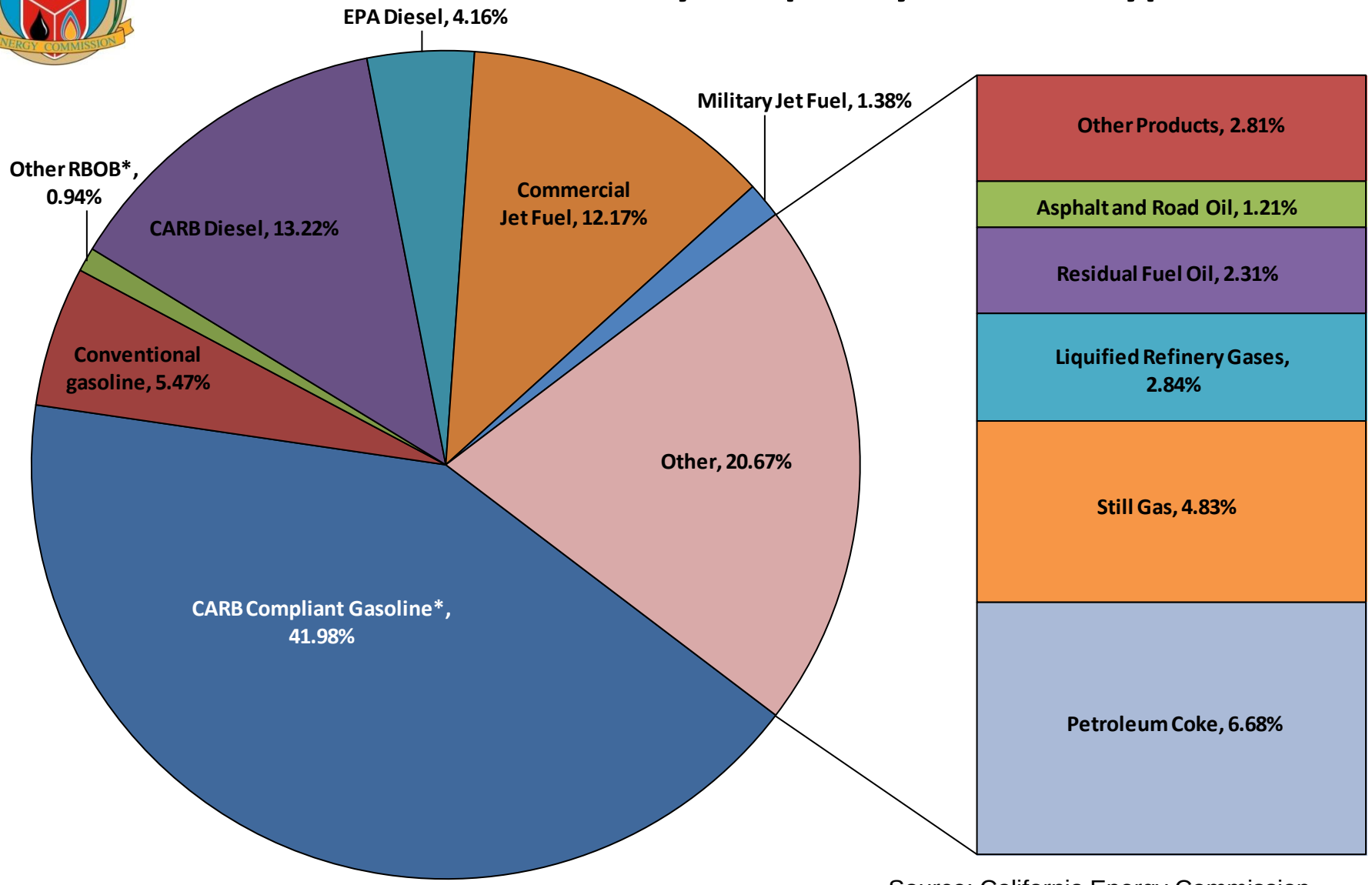
- 3 primary refinery locations
- 13 refineries produce transportation fuels that meet California standards
- 8 smaller refineries produce asphalt and other petroleum products
- California refineries provide majority of transportation fuel to neighboring states
- Process over 1.6 million barrels per day of crude oil

Key Elements - Refineries



- Refineries are a primary hub of logistical activity
  - Raw materials imported & finished products shipped
- Crude oil during 2012 received by
  - Marine vessels (foreign) - 818.1 TBD
  - Marine vessels (Alaska) – 206.9 TBD
  - California source via pipelines – 599.5 TBD
  - Rail/truck – 2.9 TBD
- Process units operate continuously at or near maximum capacity, except during periods of planned maintenance or unplanned outages

2011 California Refinery Output by Product Type



*Note: Does not include ethanol.

Source: California Energy Commission.

Key Elements – Refineries (cont)

- Output from the refineries is usually placed in intermediate tanks prior to blending the finished products
- The majority of gasoline, diesel and jet fuel is shipped from the refinery by pipeline to over 60 distribution terminals
- Tanker trucks then transport fuel to retail & non-retail stations
- Several truck trips during 2013
  - Gasoline – 39.84 MM gal/day
    - 4,980 tanker deliveries/day
  - Diesel fuel – 9.53 MM gal/day
    - 1,191 tanker deliveries/day

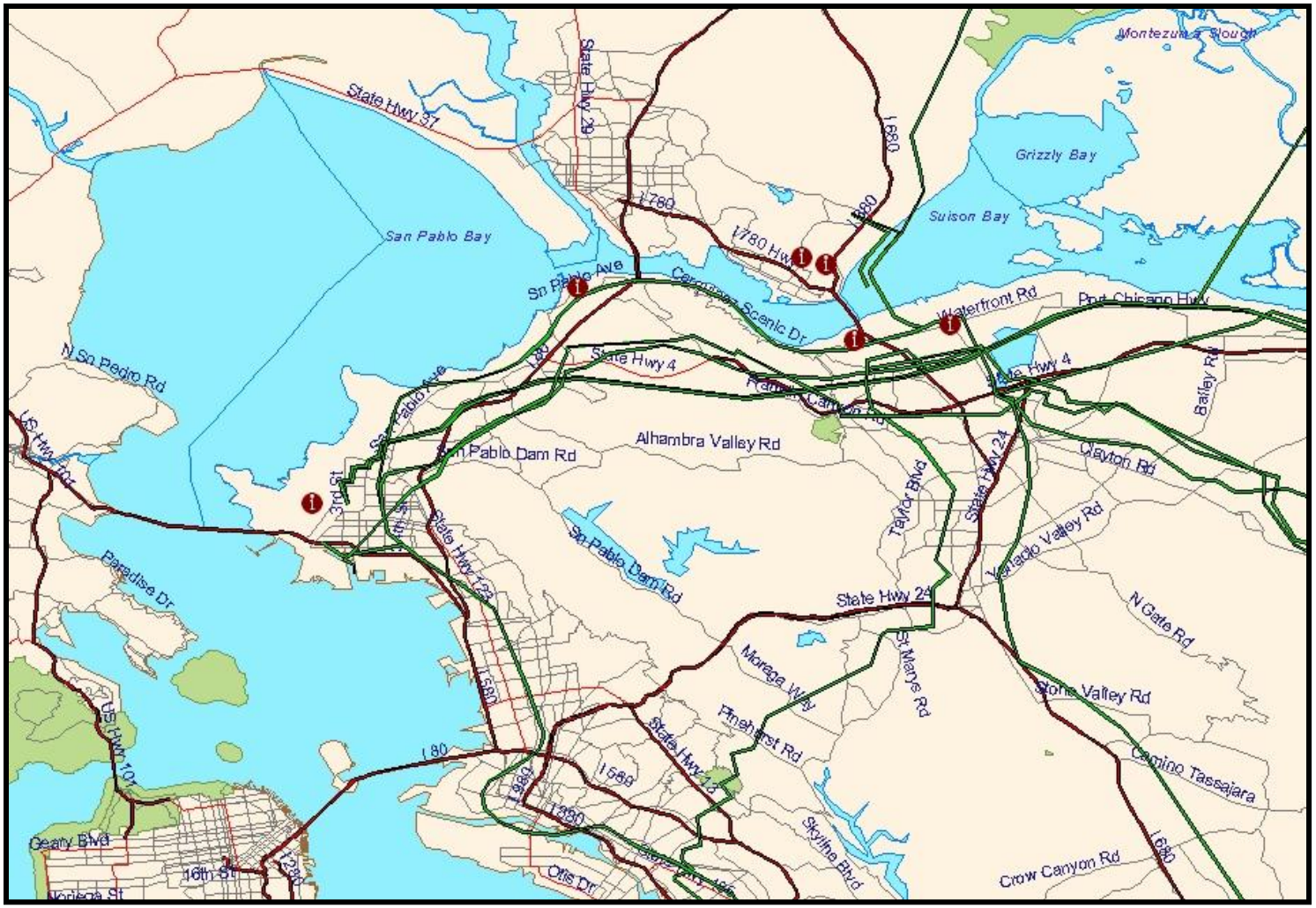
Key Elements – Pipelines

- Pipelines are used throughout the distribution infrastructure to interconnect key elements
- Intra-state pipelines are used to convey petroleum products within California's borders
- Interstate pipelines are used to export transportation fuels to Arizona and Nevada
  - NV – Over 90% of supply
  - AZ – Over 50% of supply
- Pipelines usually include pump stations, break-out tanks, storage tanks and distribution terminals
- As is the case with refineries, pipeline systems normally operate on a continuous basis
- Pipelines can only operate if transportation fuels are available to push liquid through the system

Key Elements - Pipelines (cont)

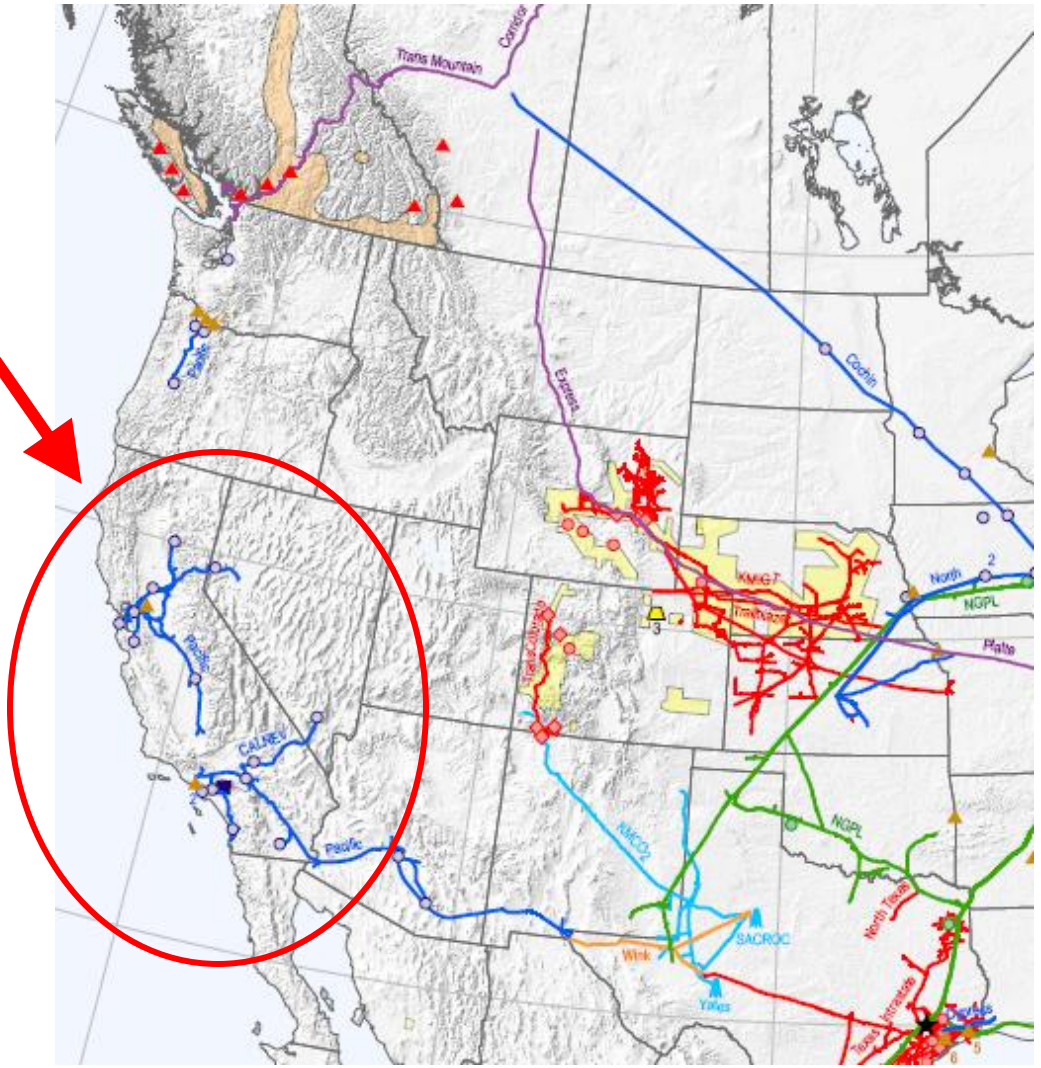
- The pipeline infrastructure in California is controlled by a combination of common carrier and private companies
- Kinder Morgan is the sole common carrier of petroleum product pipelines in the State and transports the majority of transportation fuels through its system every day
- Other private companies, such as Chevron, ExxonMobil, Shell, and Tesoro operate some proprietary systems or segments that handle the balance of transportation fuels

Bay Area Major Petroleum Pipeline Routes



Key Elements - Pipelines (cont)

- Kinder Morgan's Northern California system is not connected to its Southern California system.
- Fuel re-supply by pipeline from Southern California not possible
- Tanker trucks quickest, viable option to bring in additional fuel



Nature of Petroleum Pipeline Infrastructure

- Pipelines operate continuously
- Majority of petroleum products are transported through the pipeline infrastructure
- When the operations of the pipeline infrastructure are temporarily halted, two consequences arise:
  - Inventory levels at refineries increase because pipeline shipments are interdicted
  - Inventory levels decline at storage terminals connected to the pipeline infrastructure
- The longer the pipeline service is halted, the higher the probability that refinery operations (production) will have to be curtailed and the greater the likelihood that distribution terminals will start to run out of their supply of transportation fuels

Key Elements – Marine Facilities

- Marine facilities are located in sheltered harbors with adequate draught to accommodate typical sizes of petroleum product tankers and crude oil vessels
- Wharves usually have adjacent storage tanks that are used to temporarily hold petroleum products prior to transfer to a subsequent location
- Most refiners operate a proprietary dock
- Third party storage provides access to majors and independents
  - Kinder Morgan
  - Pacific Atlantic
  - NuStar
  - Petro-Diamond

Key Elements – Storage Tanks

- Storage tanks are vital to the continuous flow of petroleum products into and through California
- Tanks are located at docks, refineries, terminals and tank farms
- Tanks serve different storage purposes:
  - Unload marine vessels
  - Receive pipeline shipments
  - Feed truck loading facilities
  - Hold inventories in advance of planned maintenance
  - Strategic storage that can be used for emergencies or periods of rapid price increases

Rail Logistics - Ethanol

- State receives ethanol via rail unit trains at two locations
  - Lomita Rail Terminal in Carson
  - West Colton Rail Terminal
- Ethanol is then trucked to gasoline distribution terminals
  - – 4.0 MM gal/day during 2013 or 500 tanker truck deliveries/day

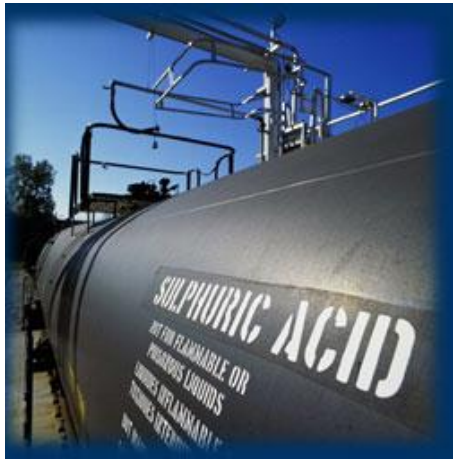
Rail Logistics - Ethanol

- Northern California has no facilities to receive unit trains of ethanol following the conversion of the KinderMorgan Richmond rail yard from ethanol to crude service during October of 2013

- Current federal and state regulations require 10% ethanol in gasoline

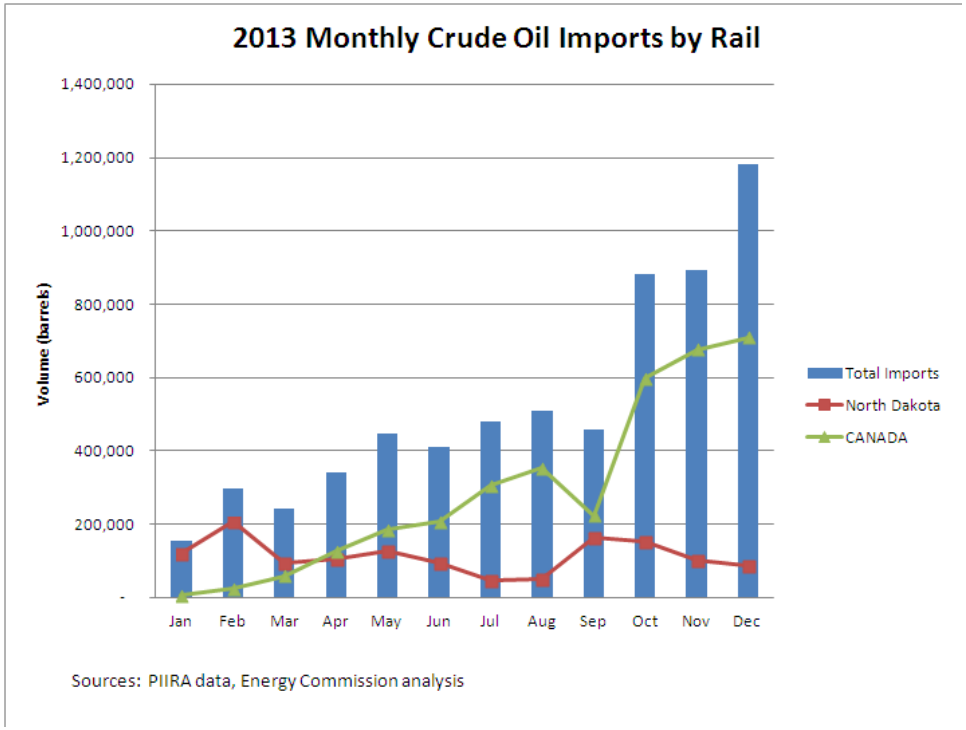
Rail Logistics – Other Uses

- Refiners use rail cars to routinely ship propane and seasonally send out and receive butane
- Rail cars are also used to deliver refinery feedstock such as gas oils and sulphuric acid for alkylation units
- More recently, California refiners have started using rail cars to import crude oil from Canada and domestic sources outside the state due to changing trends of increasing oil production and discounted prices



Rail Logistics – Crude Oil

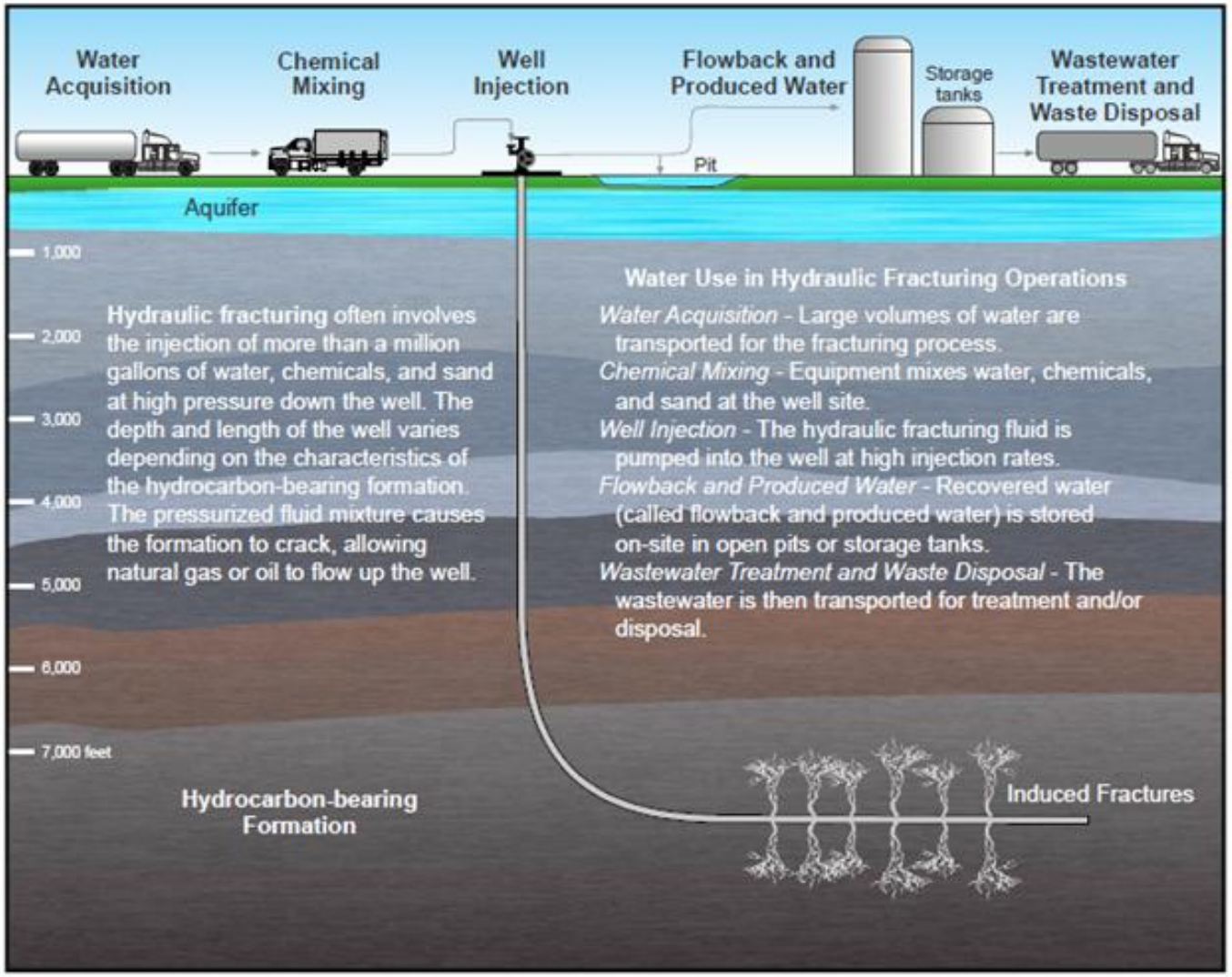
- Crude-by-rail imports growing in California
  - 1.0 percent during 2013
  - 2.0 percent by Dec. '13
- Five CBR projects seeking permits
  - 3 Northern California
  - 2 Bakersfield area
  - 1 San Luis Obispo County
- Could grow up to 23 percent by 2016



Hydraulic Fracturing Overview

- Hydraulic fracturing or fracking is not a new procedure and is estimated to have been used in over one million wells worldwide
- According to the California Independent Producers Association…
  - *Hydraulic fracturing is a type of "completion" technique where high pressure water, sand, and chemicals are injected usually thousands of feet below the surface into low permeability rock to create microscopic fractures that allow oil and natural gas trapped in small pores to migrate to the wellbore and be produced.*
  - *The injected fluid for each hydraulic fracturing job is typically 95% water, 4.5% sand, and 0.5% chemicals.*
- Fracking had initially been utilized as early as 1947 in Kansas
- California fracking activity dates back to the 1950s

Hydraulic Fracturing Schematic

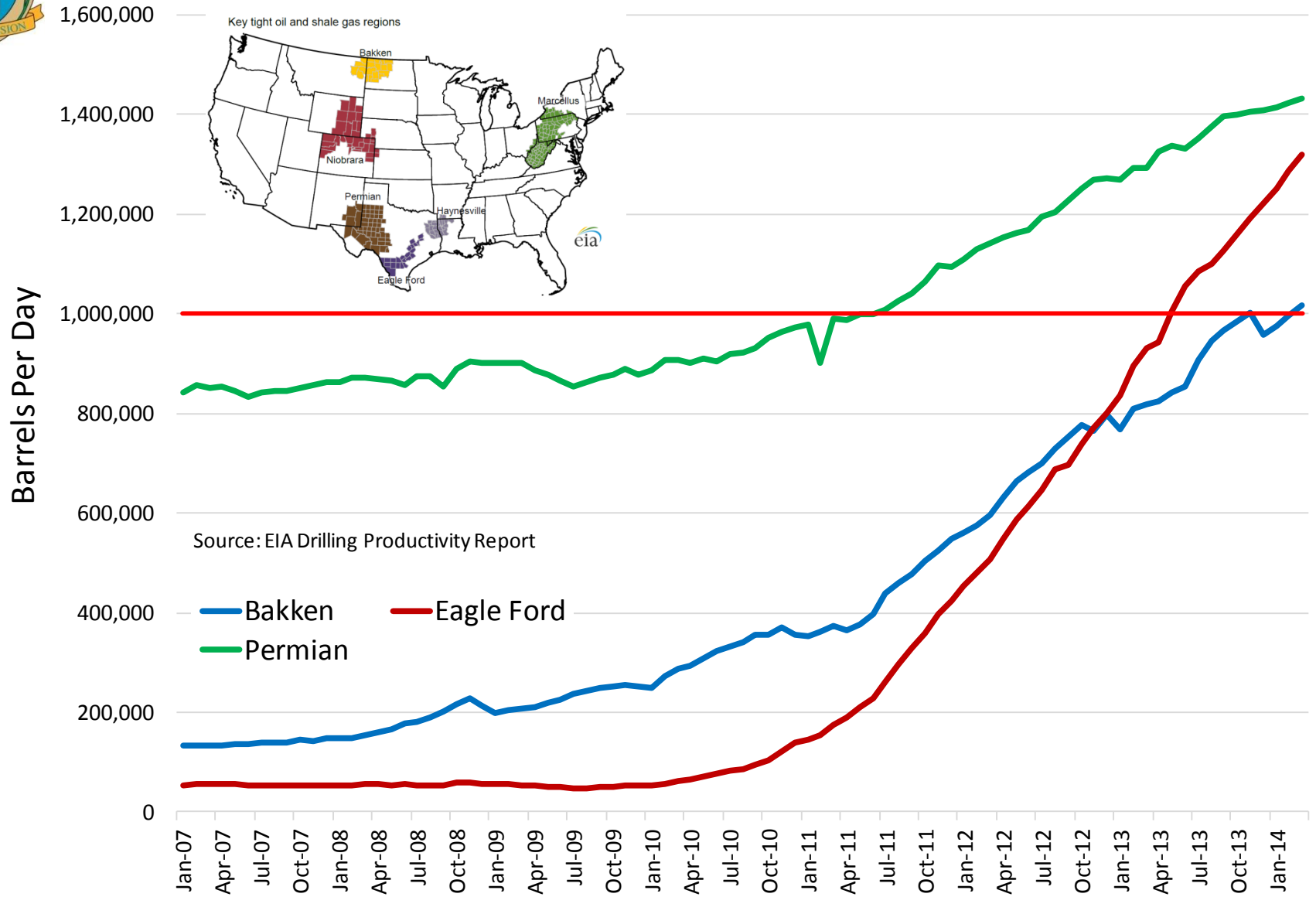


Source: EPA Hydraulic Fracturing Study Plan, November 2011, page 13.

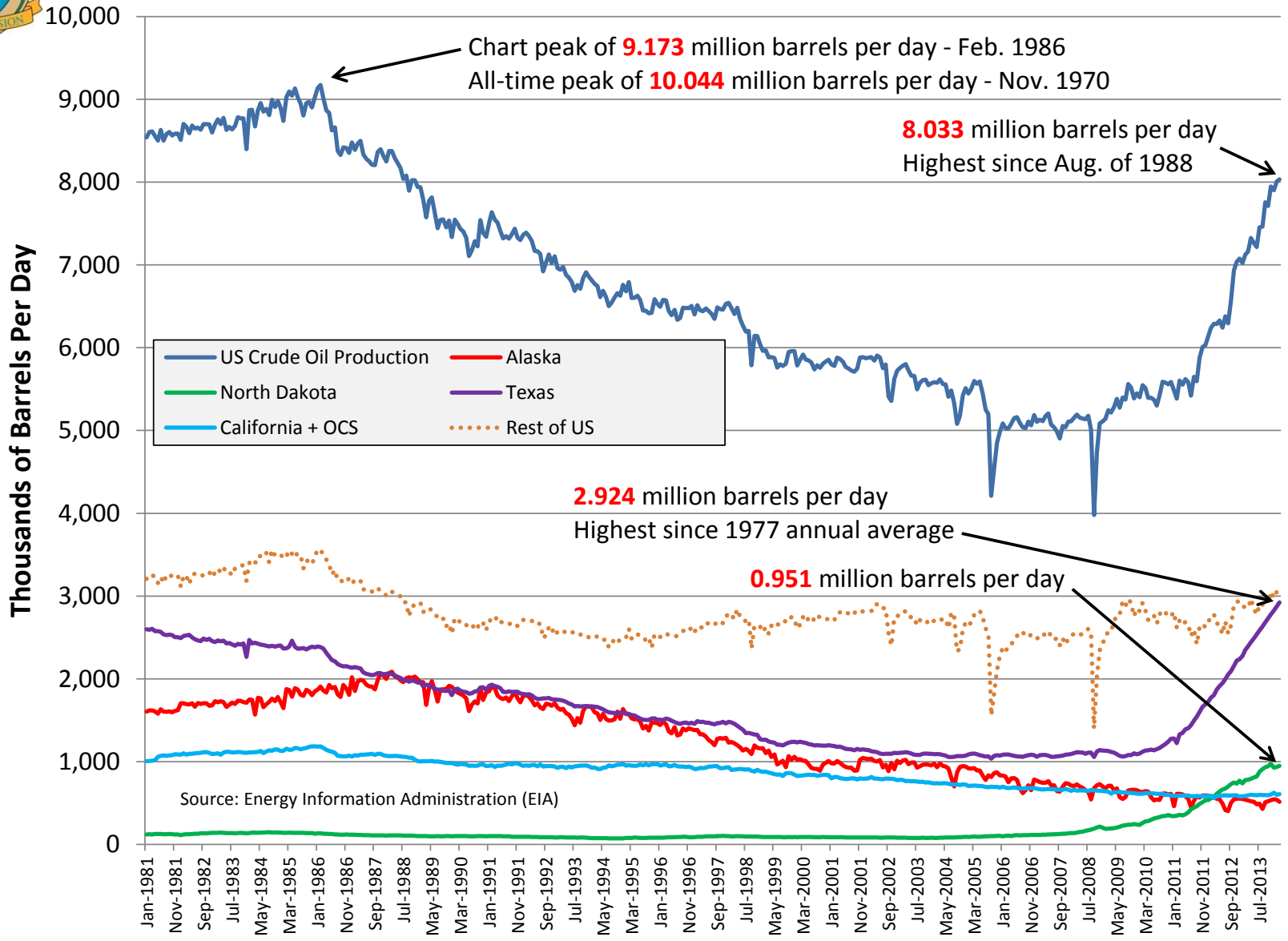
Hydraulic Fracturing – New Paradigm

- Hydraulic fracturing in California could halt production decline and result in a resurgence of output – but too early to tell
- However, hydraulic fracturing activity in North Dakota and Texas has dramatically increased domestic crude oil production
- Increased output has outpaced the ability of industry to transport this extra crude oil to refiners via a network of pipelines
- Expansion of existing crude oil pipeline systems and construction of new pipeline segments have increased the ability to ship crude oil from these regions…but not fast enough
- Temporary gluts of crude oil compelled producers to discount their price for the oil sufficient to enable the economic transportation by rail cars

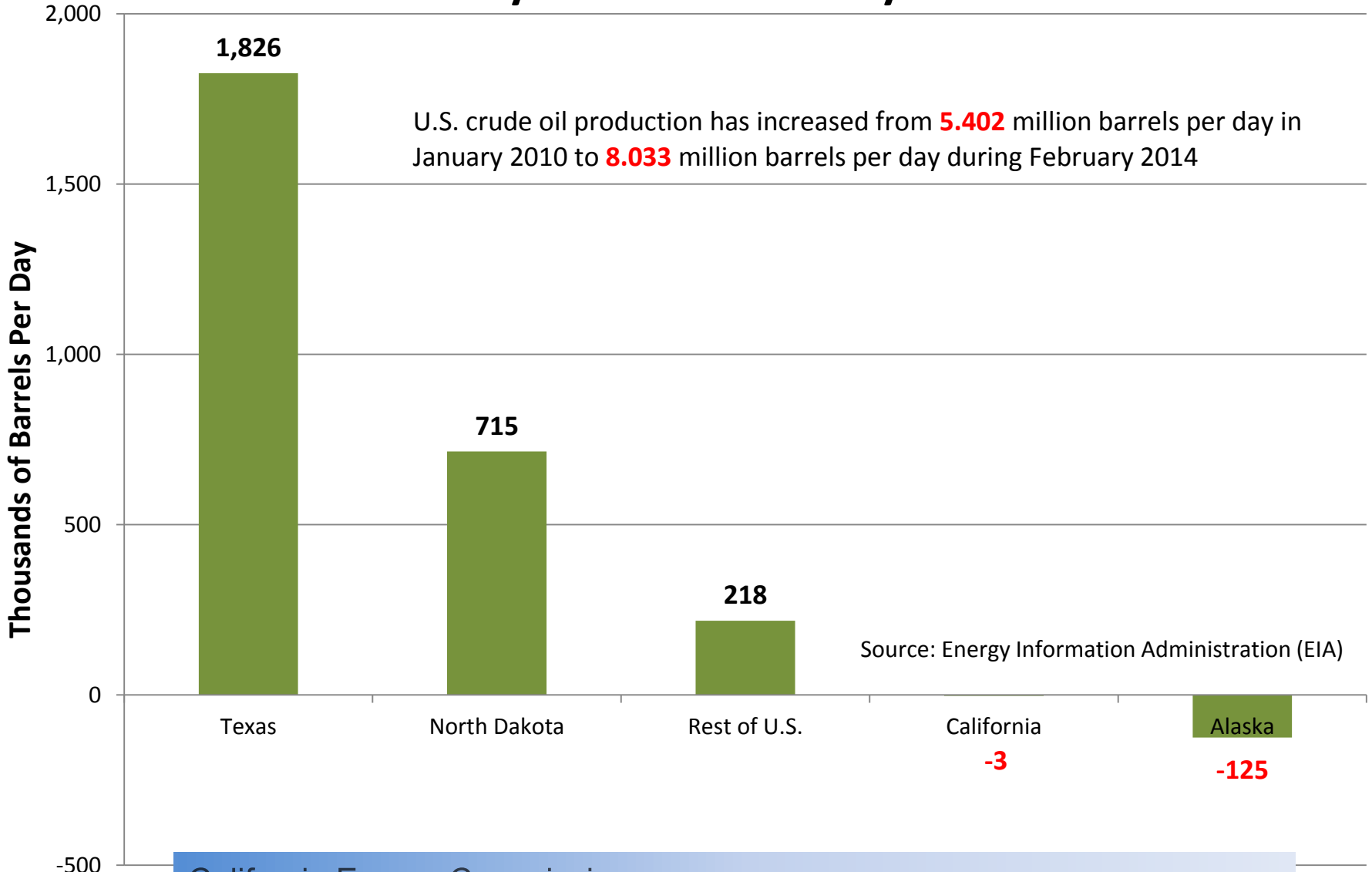
U.S. Tight Crude Oil Production Surging



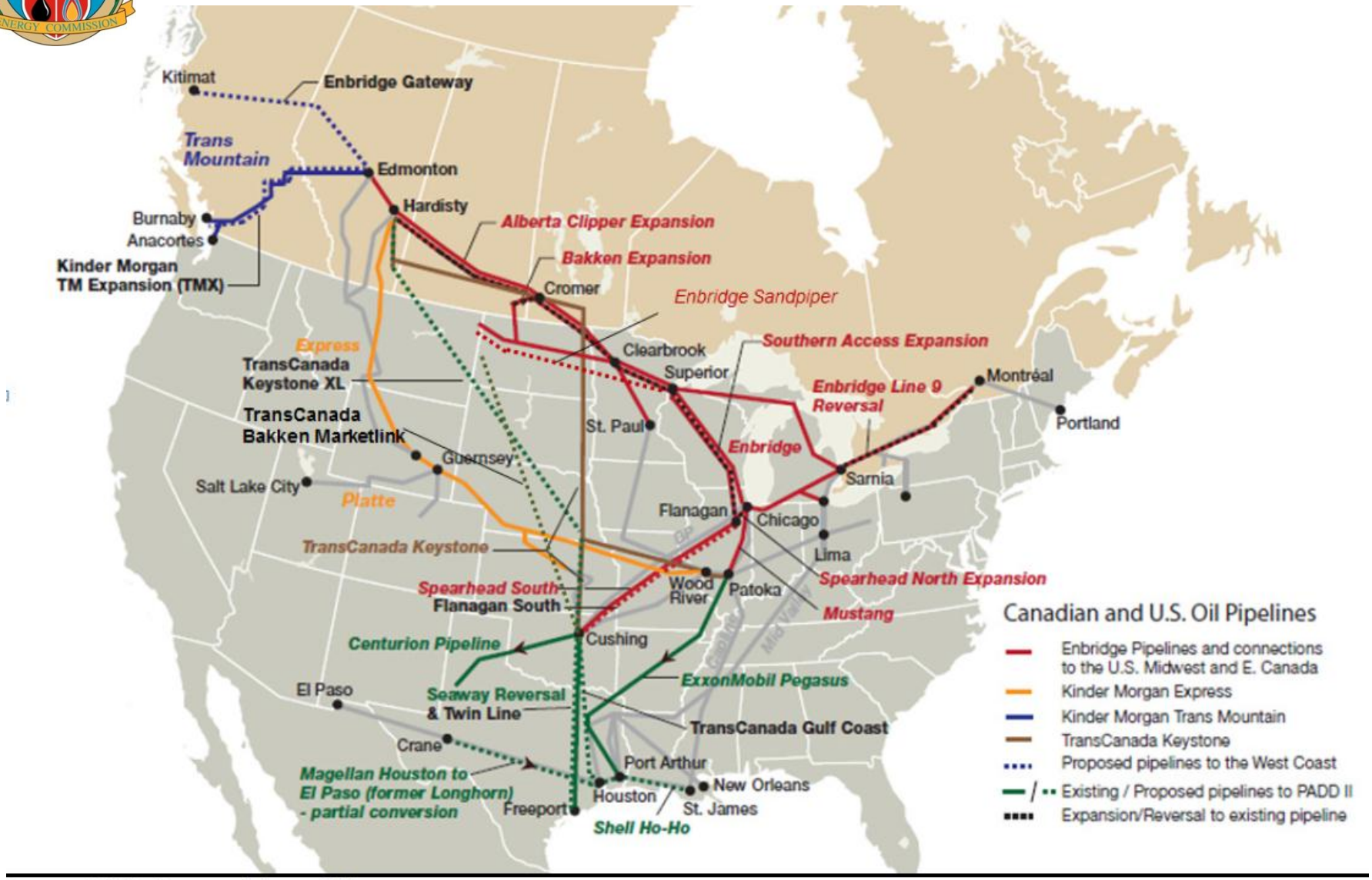
U.S. Crude Oil Production Rebounding



Change in Crude Oil Production
January 2010 vs. February 2014

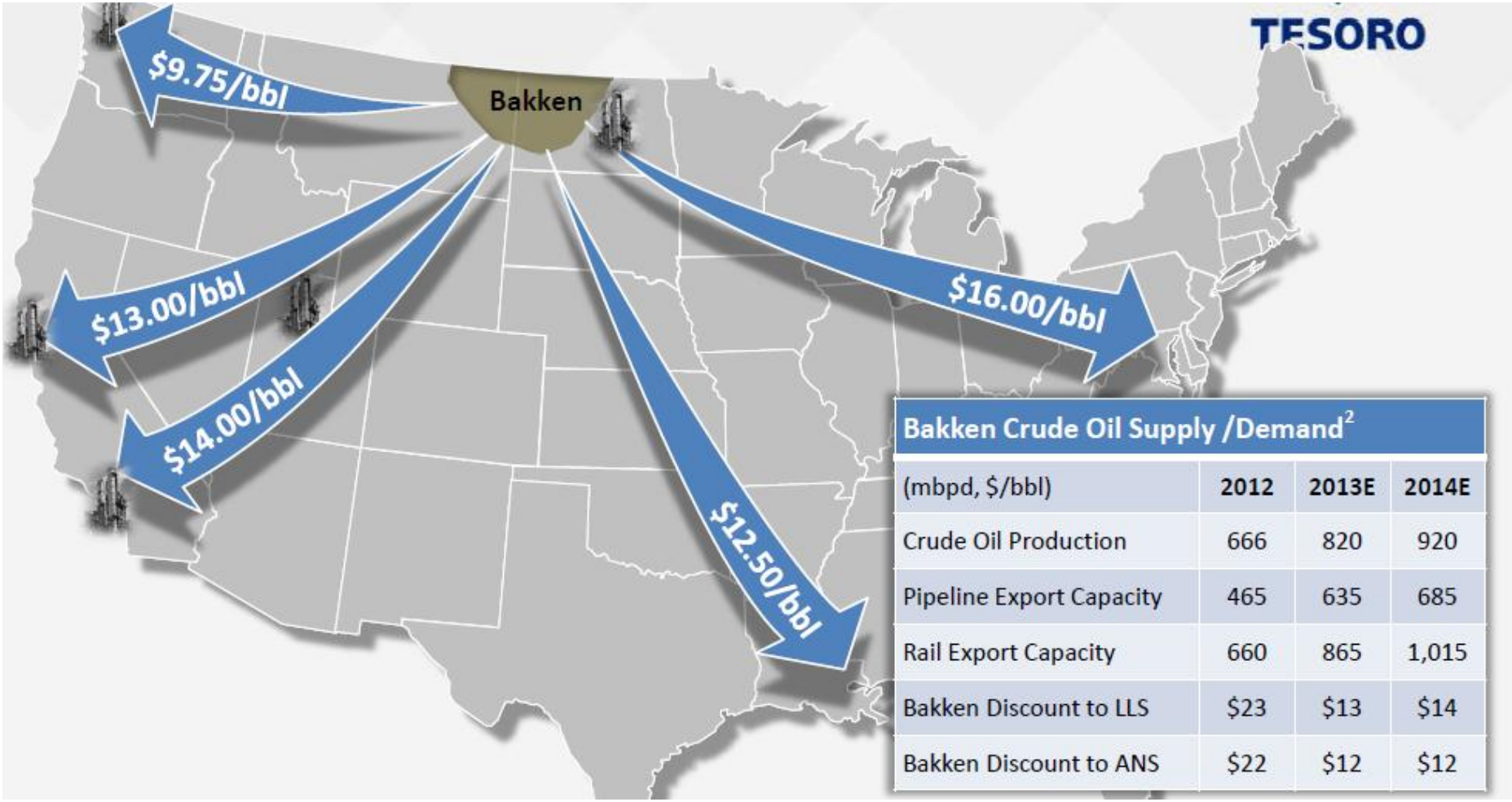


Crude Oil Pipeline Projects



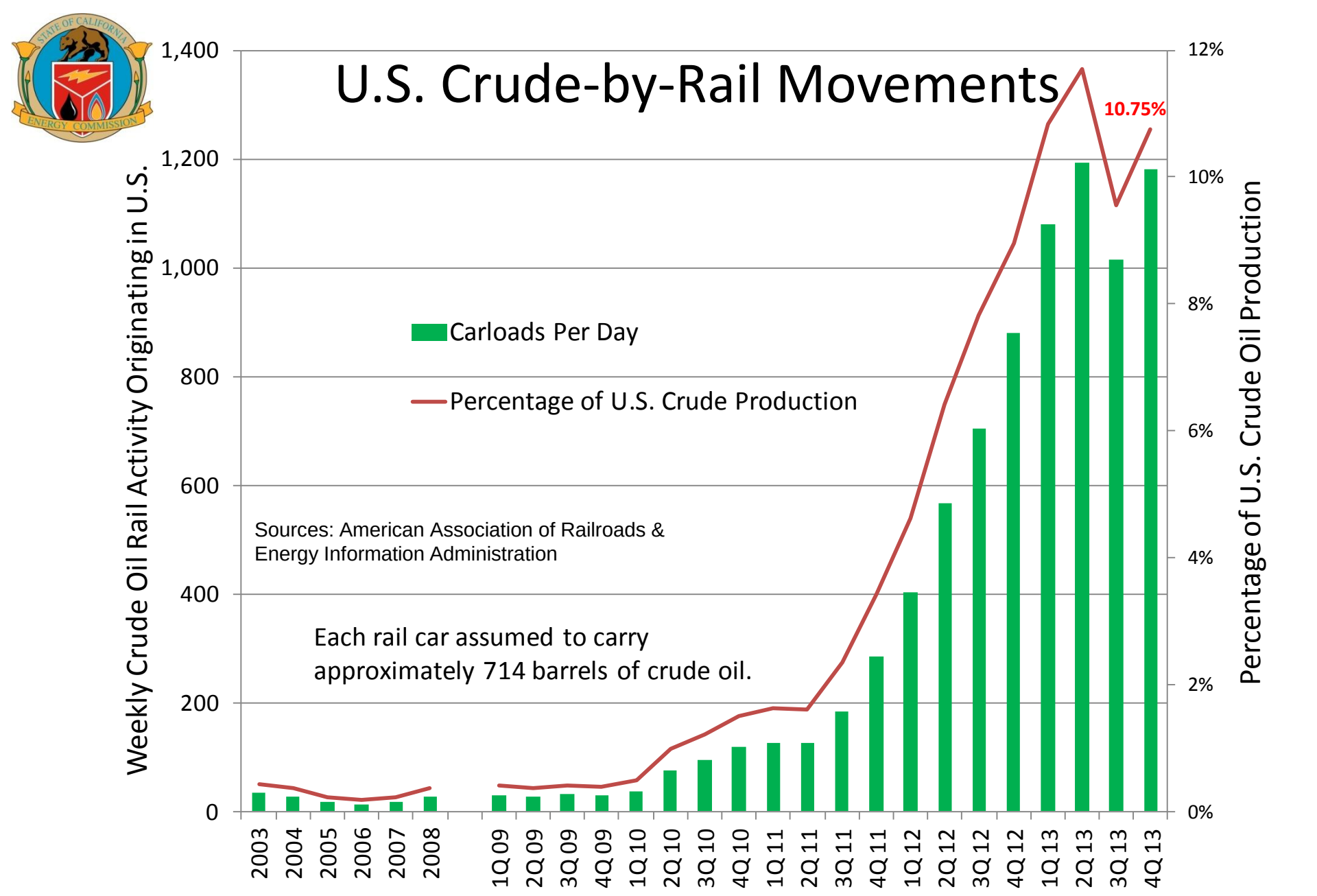
Source: CAPP, Raymond James Ltd.

Crude Oil Discounts Enable Rail Movements



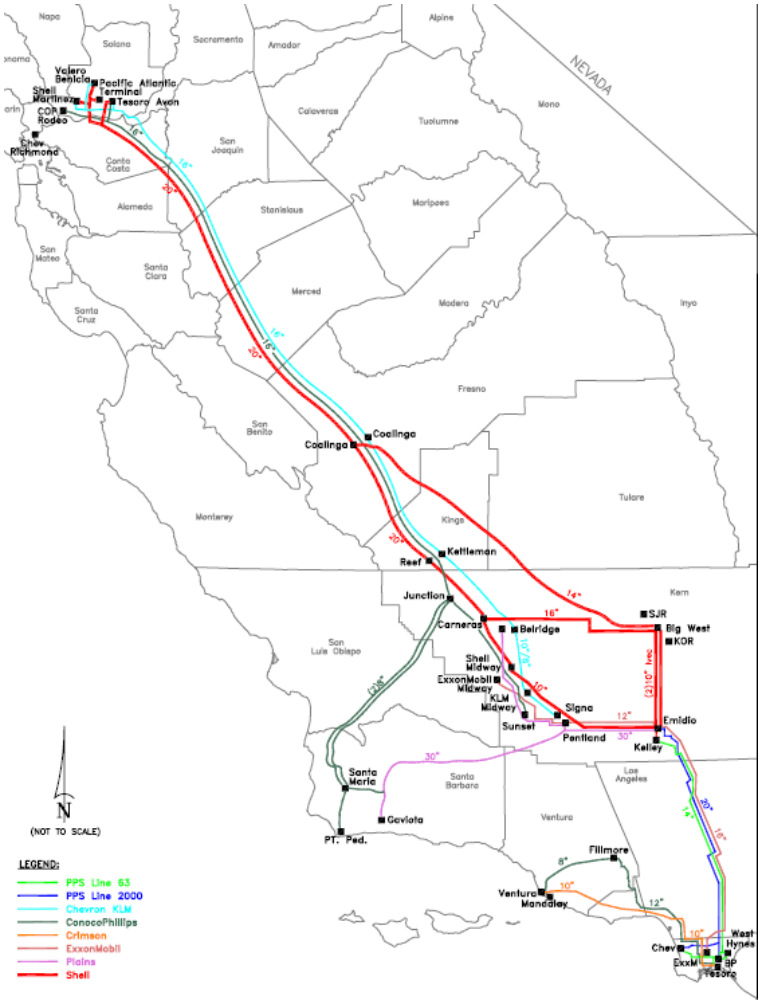
Bakken Crude Oil Supply /Demand[2]			
(mbpd, $/bbl)	2012	2013E	2014E
Crude Oil Production	666	820	920
Pipeline Export Capacity	465	635	685
Rail Export Capacity	660	865	1,015
Bakken Discount to LLS	$23	$13	$14
Bakken Discount to ANS	$22	$12	$12

Source: Barclays CEO Energy-Power Conference, Tesoro, September 2013


U.S. Crude-by-Rail Movements
Weekly Crude Oil Rail Activity Originating in U.S.
Percentage of U.S. Crude Oil Production
1,400
1,200
1,000
800
600
400
200
0
12%
10%
8%
6%
4%
2%
0%
10.75%
Carloads Per Day
Percentage of U.S. Crude Production
Sources: American Association of Railroads &
Energy Information Administration
Each rail car assumed to carry
approximately 714 barrels of crude oil.
2003
2004
2005
2006
2007
2008
1Q 09
2Q 09
3Q 09
4Q 09
1Q 10
2Q 10
3Q 10
4Q 10
1Q 11
2Q 11
3Q 11
4Q 11
1Q 12
2Q 12
3Q 12
4Q 12
1Q 13
2Q 13
3Q 13
4Q 13

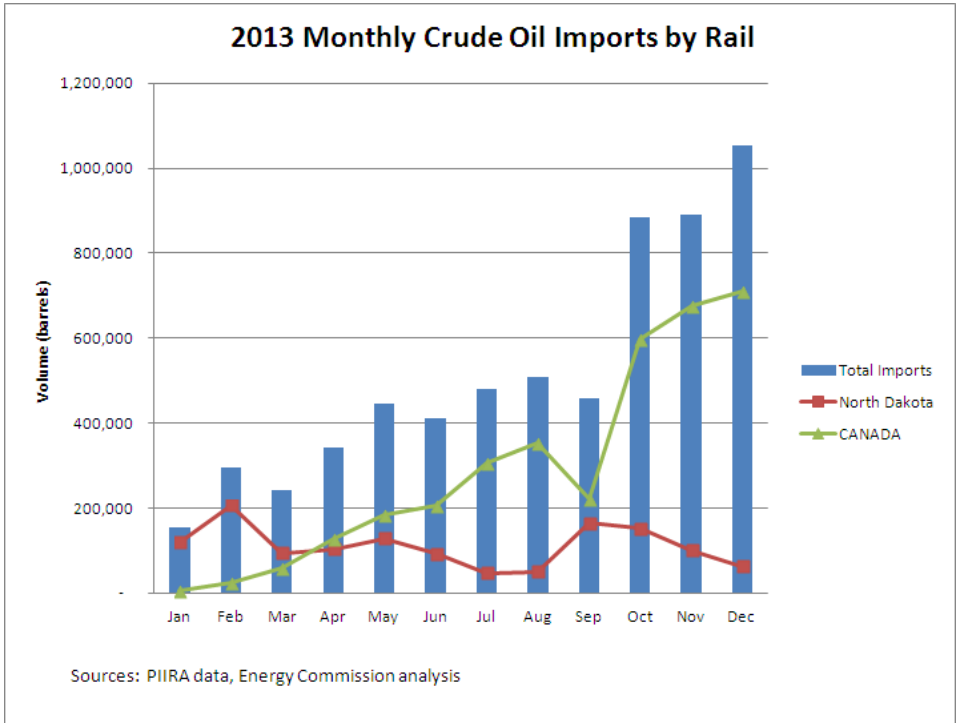
Crude Oil Sources – Bay Area Refineries

- Northern California refineries processed 642.2 thousand barrels per day of crude oil during 2012
  - 316.0 TBD foreign marine imports
  - 247.8 TBD pipeline shipments
  - 77.8 TBD ANS marine imports
  - 0.6 TBD rail imports
- Bay Area refineries processed 39.5 percent of total crude oil
- Increased crude-by-rail likely to back out marine receipts of similar quality
- Rail capability increases flexibility to enhance supply options & reduces risk of crude oil receipt curtailment



Source: Plains All American

California Crude-by-Rail Imports Grow



2013 Crude-By-Rail Imports		
California Energy Commission Country or State of Origin for Railcars	2013 Total Barrels	2013 Percentage
California Totals		
Canada	3,472,050	55.15%
Colorado	500,706	7.95%
New Mexico	411,725	6.54%
North Dakota	1,348,681	21.42%
Utah	59,004	0.94%
Wyoming	441,398	7.01%
Other States	62,621	0.99%
Subtotals	6,296,185	100.00%
Northern California		
Canada		
Colorado	157,836	12.54%
New Mexico		
North Dakota	1,075,861	85.45%
Utah		
Wyoming		
Other States	25,366	2.01%
Subtotals	1,259,063	100.00%
Bakersfield & Southern California		
Canada	3,472,050	68.93%
Colorado	342,870	6.81%
New Mexico	411,725	8.17%
North Dakota	272,820	5.42%
Utah	59,004	1.17%
Wyoming	441,398	8.76%
Other States	37,255	0.74%
Subtotals	5,037,122	100.00%

Other States include Illinois, Nebraska, Oklahoma, Texas and Washington.

- 2012 CBR imports – 1.09 MM Bbls
- 2013 CBR imports – 6.30 MM Bbls
  - Approximately 9,600 rail tank cars

Crude-by-Rail Projects – Northern California

WesPac Energy Project – Pittsburg - Planned

- Rail receipt average capability of 50,000 barrels per day (BPD)
- Also plan marine terminal for receipt and loading – average of 192,000 BPD
- Combined average receipt capability of 242,000 BPD
- Connection to KLM pipeline – access to Valero, Shell, Tesoro & Phillips 66 refineries
- Connection to idle San Pablo Bay Pipeline – access to Shell, Tesoro & Phillips 66 refineries
- Construction could be completed within 18 months of receiving all permits

Valero – Benicia Crude Oil By Rail Project - Planned

- Benicia refinery
- Up to 100 rail cars per day
- Up to 70,000 BPD
- Draft EIR scheduled to be released June 10, 2014
- Operational 2015, first quarter

Crude-by-Rail Projects – Rest of California

Alon Crude Flexibility Project - Planned

- Alon – Bakersfield Refinery
- 2 unit trains per day
- 104 rail cars per unit train
- 150,000 BPD offloading capacity
- Will be able to receive heavy crude oil
- Oil tankage connected to main crude oil trunk lines – transfer to other refineries
- Seeking public comment by May or June 2014
- Construction could begin late 2014 or early 2015 – take 9 months to complete

Valero – Wilmington Refinery – Canceled

- Up to 60,000 BPD
- Withdrew permit application

Phillips 66 – Santa Maria Refinery – Planned

- Up to 41,000 BPD
- Planning Commission meeting on revised EIR scheduled for late 2014
- Construction expected to take 9 to 12 months to complete

Plains All American – Bakersfield Crude Terminal – Planned

- Purchased UDS assets, including "planned" project
- Up to 65,000 BPD
- Non-exclusive Franchise Pipeline Agreement application final permit
- Connection to existing crude oil lines via new six-mile pipeline
- Operational late 2014 or early 2015

Crude-by-Rail Projects – Outside California

Tesoro – Anacortes Refinery – Operational

- Up to 50,000 BPD
- 40 percent of refinery crude oil supply
- Operational September 2012

Phillips 66 – Ferndale Refinery – Operational

- Up to 20,000 BPD, mixed freight cars
- Permits received for expansion to 40,000 BPD in 2014 – ready by late 2014

BP – Cherry Point Refinery – Operational

- Up to 60,000 BPD
- Operational by December 26, 2013

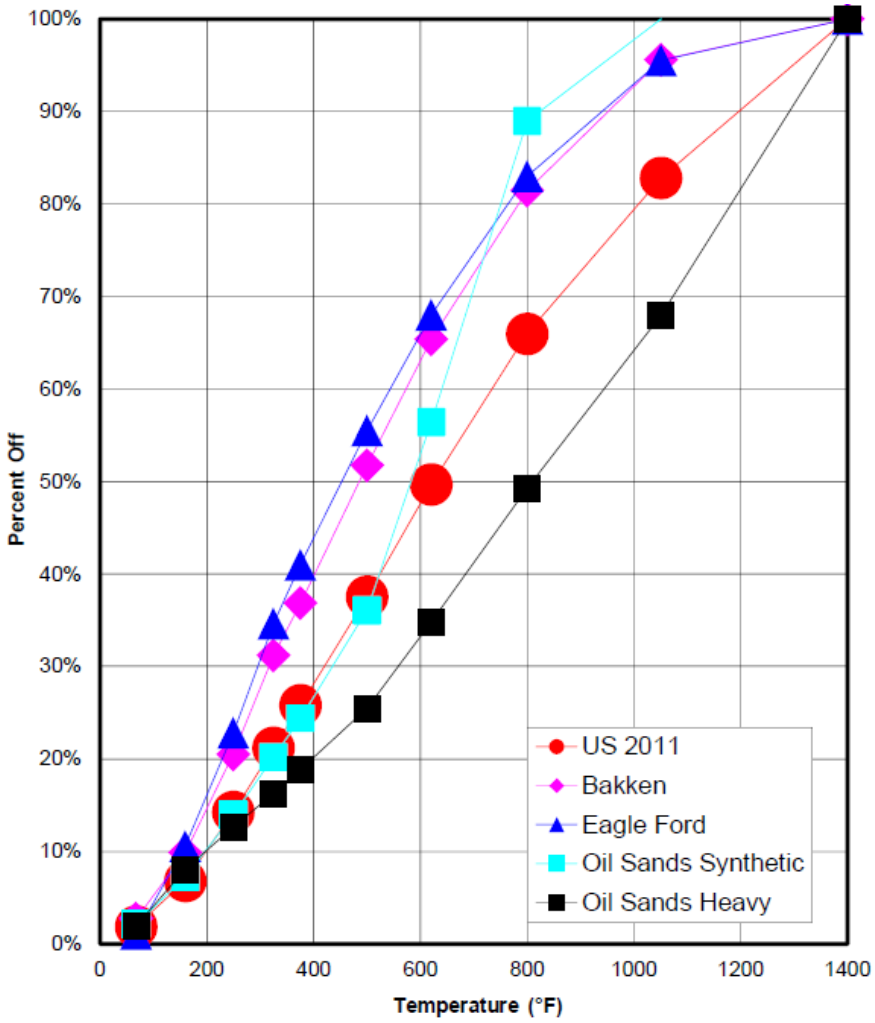
Tesoro – Savages, Port of Vancouver Project – Planned

- Rail receipts of unit trains & loading of marine vessels
- Initial capacity up to 120,000 BPD
- Tesoro will have off-take rights to 60,000 BPD
- Expansion capability of up to 280,000 BPD
- Port authority approved proposal on 7/24/13
- Initial start-up during 2015

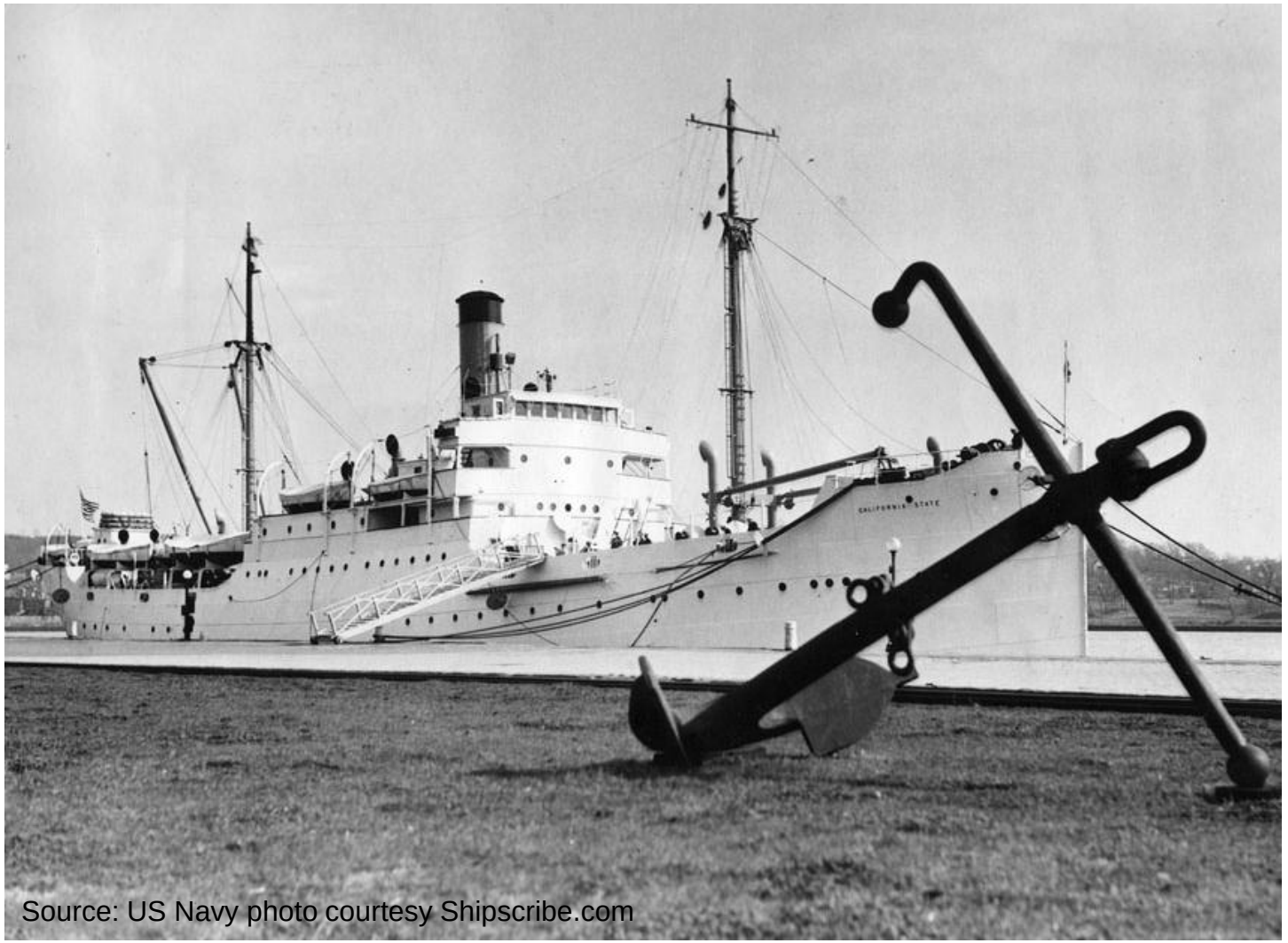
Crude-by-Rail Characteristics

Crude Fractions and Properties	2011 U.S. Crude Slate	Light Tight Oil		Canadian Oil Sands	
		Bakken	Eagle Ford	Syn-thetic	Heavy
WHOLE CRUDE					
API Gravity	30.5	41.8	47.0	33.3	20.3
Sulfur (wt %)	1.41%	0.13%	0.11%	0.21%	3.52%
CRUDE FRACTIONS					
LPGs:					
Ethane	0.001	0.000	0.000	0.000	0.000
Propane	0.003	0.005	0.002	0.001	0.001
Isobutane	0.004	0.007	0.003	0.004	0.005
Butane	0.012	0.016	0.007	0.017	0.014
Naphthas:					
Very Light (C5-160)	0.049	0.071	0.095	0.051	0.061
Light (160-250)	0.075	0.107	0.122	0.067	0.046
Medium (250-325)	0.070	0.107	0.118	0.062	0.036
Heavy (325-375)	0.046	0.056	0.064	0.042	0.026
Middle Distillates:					
Kerosene (375-500)	0.118	0.149	0.145	0.117	0.066
Distillate (500-620)	0.121	0.136	0.125	0.203	0.093
Atmospheric Resid:					
Light gas oil (620-800)	0.163	0.161	0.150	0.325	0.144
Heavy gas oil (800-1050)	0.168	0.141	0.125	0.111	0.187
Resid (1050+)	0.173	0.044	0.045		0.321
SULFUR (wt%)					
Kerosene (375-500)	0.25%	0.02%	0.02%	0.06%	0.62%
Distillate (500-620)	0.68%	0.09%	0.07%	0.12%	1.38%
Gas Oils (620-1050)	1.49%	0.24%	0.19%	0.38%	3.03%
Resid (1050+)	3.59%	0.68%	0.60%		5.99%

Source: MathPro, Inc.



Questions?



TS *California State*, April 7, 1932, Washington Navy Yard, Washington D.C.