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Market-based Policy Concepts
Overview & Issues

Petroleum Market Advisory Committee Meeting

California Energy Commission

Sacramento, California

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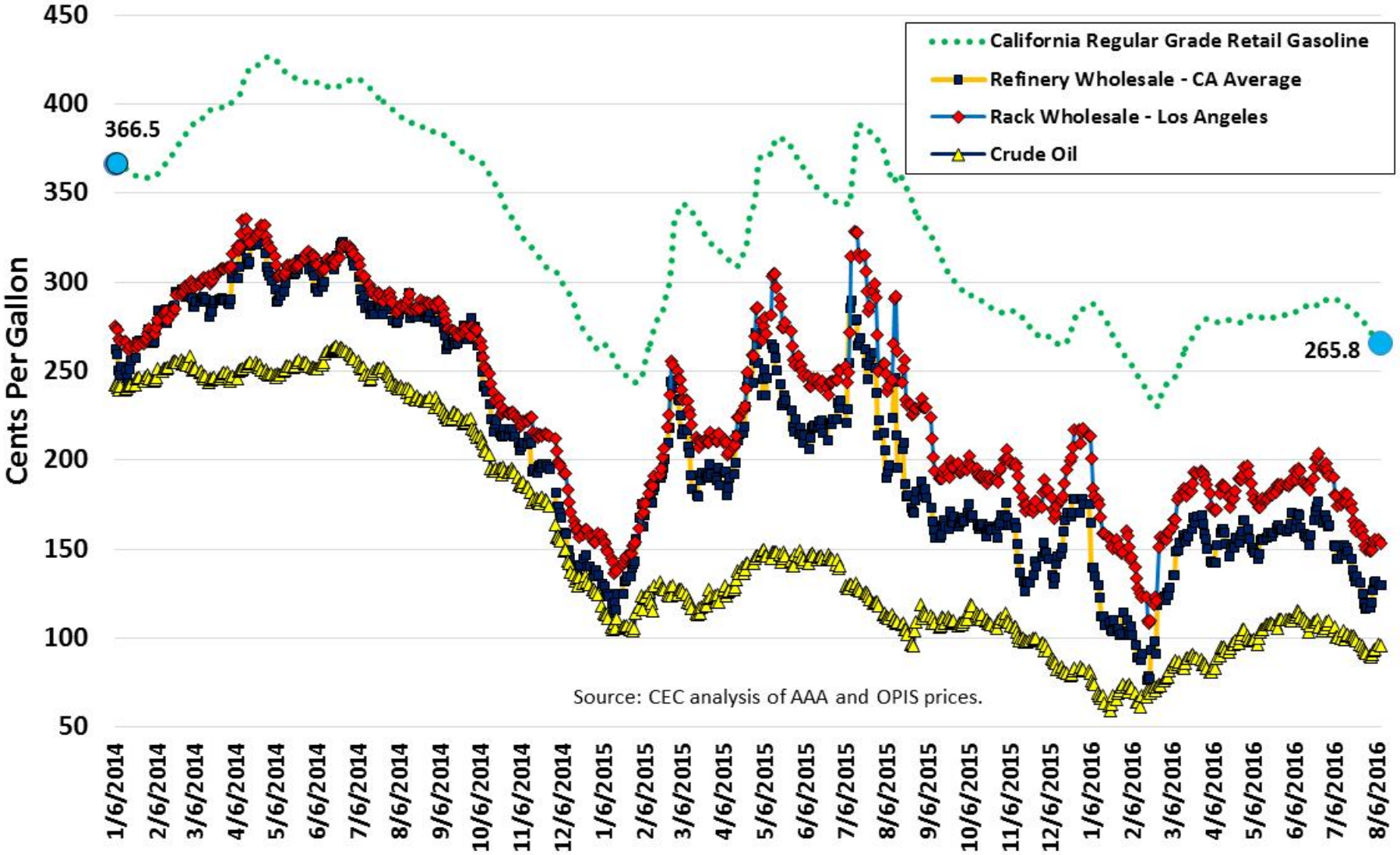
Overview

- Price spikes in California
  - Can be significant
  - Usually short-lived at refinery wholesale level (spot price)
  - Wholesale distribution terminal prices influenced by refinery spot
  - Retail prices influenced by distribution terminal prices
- Market-based policy concepts
  - Purpose to decrease magnitude of and/or duration of price spikes
- PMAC has proposed three preliminary concepts for discussion today
  - Price Pressure Relief Valve (PPRV)
  - Gasoline inventory requirements
  - Forward purchase of gasoline by state

California Gasoline Price Changes
Retail, Rack and Refinery Wholesale



Price Pressure Relief Valve (PPRV)

- Price pressure relief valve preliminary concept --
  - California would allow gasoline to be sold that meets only Federal Reformulated Gasoline (RFG) or conventional gasoline so long as the seller paid a surcharge to the state.
  - The surcharge would be set high enough, perhaps 25 cents per gallon, so that during normal supply/demand balances in the market for CARB gasoline there would be no incentive for a seller to utilize the non-CARB option.
  - The surcharge could be different for Federal RFG than for conventional gasoline.
  - Revenue from the surcharge could be used to offset any increased pollution from the use of non-CARB gasoline, such as by buying back older high-polluting cars.

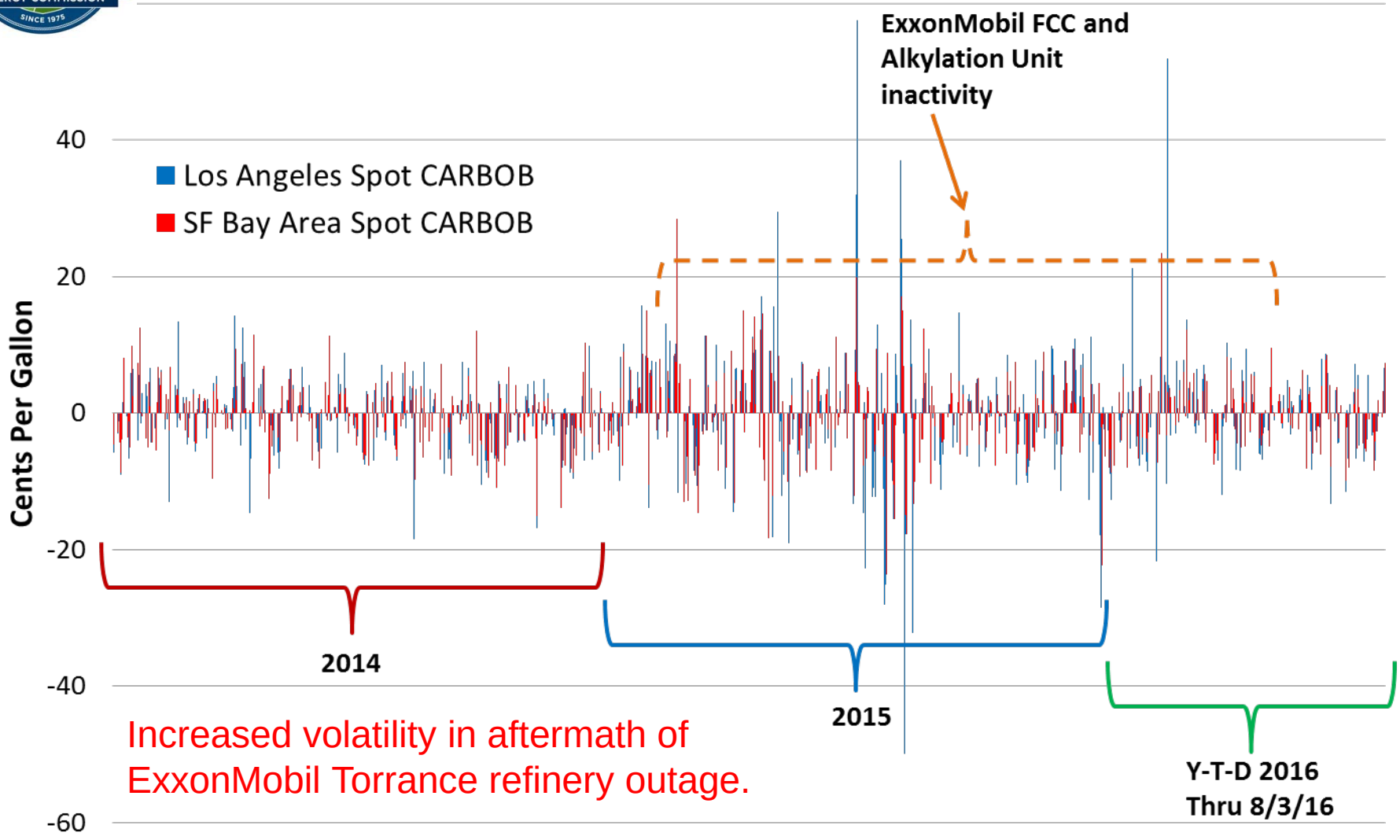
Price Pressure Relief Valve (PPRV)

- PPRV – Issues that should be examined
  - How quickly do refinery wholesale prices peak and decline?
  - How rapidly can gasoline supplies be delivered to California from outside the state?
  - What types of potential marine shipping limitations might exist?
  - How is gasoline usually distributed from refineries to retail stations?
  - What difficulties could be encountered by introducing non-complying gasoline into this distribution system?

Price Pressure Relief Valve (PPRV)

- PPRV – *How quickly do refinery wholesale prices peak and decline?*
  - Normally spot prices changes are less than 5 cpg between one business day and the next
    - 69 to 75 percent of time during 2014
    - 48 to 59 percent during 2015
    - 63 to 74 percent of time during Y-T-D 2016
  - Changes that were between 5 and 10 cpg
    - 21 to 26 percent of time during 2014
    - 28 to 32 percent during 2015
    - 24 to 28 percent of time during Y-T-D 2016
  - Changes that were greater than 10 cpg
    - 4 to 5 percent of time during 2014
    - 12 to 20 percent during 2015
    - 2 to 8 percent of time during Y-T-D 2016

Spot Gasoline Price Changes



Sources: CEC analysis of Oil Price Information Service CARBOB prompt spot pipeline prices.

Price Pressure Relief Valve (PPRV)

- PPRV – *How rapidly can gasoline supplies be delivered to California from outside the state?*
  - Importation of non-California gasoline in response to a price spike requires a minimum amount of time to:
    - Identify a supply source – 1 day
    - Locate and arrange for a spot lease of a marine vessel – 1 to 2 days
    - Transit time for the vessel to arrive at the supply source – 1 to 3 days
    - Load the vessel with the non-California gasoline – 1 to 3 days
    - Transit time to a California marine terminal – 2 to 21 days
    - Discharge time for marine vessel – 1 to 3 days
    - ***Total combined time – 7 to 33 days – could be longer***
  - Most price spikes in the spot pipeline markets for gasoline peak and begin to recede within 7 days
    - Refinery wholesale price spike is usually over before a cargo can be delivered, damage is already done – spot increase has been passed along to wholesale rack and retail prices – importer at risk of losing money

Price Pressure Relief Valve (PPRV)

- PPRV – *What types of potential marine shipping limitations might exist?*
  - Movement of goods from one U.S. port to another U.S. port requires use of a Jones Act certified marine vessel
    - Vessel that is constructed, owned, operated, and crewed by U.S. entities
      - Nationwide, 51 Jones Act eligible tankers in service as of 5/31/16
    - Availability of these vessels is normally limited, especially along the West Coast
    - Cost of Jones Act vessels is normally greater than that of foreign-flagged tankers – at times significantly more expensive

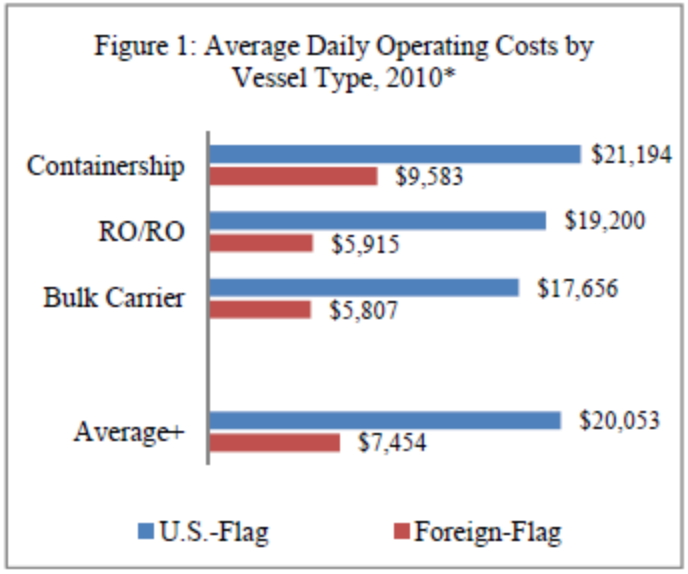


Figure Source: *Comparison of U.S. and Foreign-Flag Operating Costs*, US DOT Maritime Administration, September 2011, page 4.

Price Pressure Relief Valve (PPRV)

- PPRV – *How is gasoline usually distributed from refineries to retail stations?*
  - There are approximately 55 to 60 distribution terminals that are used to load tanker trucks prior to delivery to retail stations and card-lock facilities
  - Nearly all of these terminals are connected via petroleum product pipeline segments and systems that are either proprietary or common carrier status
  - Spare storage tankage is generally limited
  - Gasoline shipped through the pipeline distribution systems is first "created" in final shipment tanks by the mixing of several different types of gasoline blending components in specific ratios intended to comply with gasoline specifications and minimize production costs
  - This "base" gasoline is shipped to these distribution terminals where ethanol is introduced to the gasoline when tanker trucks are loaded

Price Pressure Relief Valve (PPRV)

- PPRV – *What difficulties could be encountered by introducing non-complying gasoline into this distribution system?*
  - The number and size of storage tanks at distribution terminals is based on the maximum quantity of petroleum product that is historically delivered to each location during a pipeline "cycle" that is between 7 to 8 days in length
  - At most distribution terminals, receipts of gasoline in the pipeline are directed to community storage tanks that contain deliveries from multiple refineries
    - Receipt of non-complying gasoline into these community storage tanks would contaminate the other gasolines
    - Ability to enforce gasoline regulations downstream of terminals would be compromised for all locations receiving gasoline from these contaminated community storage tanks
  - Could be similar problem for marine importing infrastructure – depending on nature of storage tank and interconnecting pipeline segments used to discharge cargoes of gasoline from marine vessels

Minimum Gasoline Inventory Holdings

- Inventory requirements for each fuel seller preliminary concept --
  - California would require every seller of CARB gasoline to hold inventory – either physically themselves or through legal control of inventory held by another entity – equal to X% of the seller's monthly average CARB sales volume, during normal supply times.
  - If the regulatory entity (i.e. the CEC) were to determine CARB gasoline prices are abnormally high, it could then temporarily reduce the inventory requirement, allowing additional supplies to be released into the market.

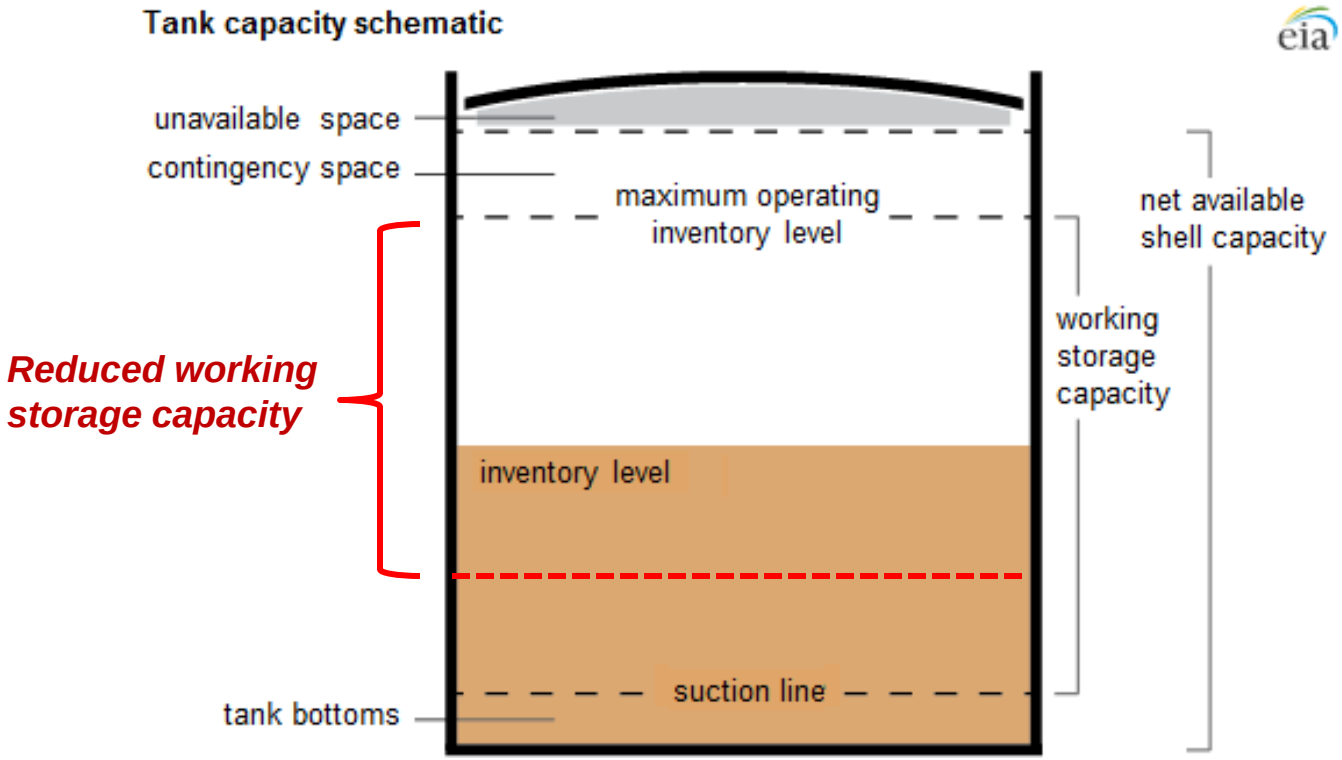
Minimum Gasoline Inventory Holdings

- Minimum Inventory – Issues that should be examined
  - How do refiners & other marketers use their storage tanks?
    - How might minimum inventory levels impact operations?
  - Reaction to requirement?
    - Reduction of strategic inventories by non-refiners?
    - Construction of new storage tanks?
  - What would be the trigger?
    - Specific or subjection “release” mechanisms?
  - Are there other “storage-related” concepts that should also be examined?

Minimum Gasoline Inventory Holdings

- Minimum Inventory – *How do refiners & other marketers use their storage tanks?*
  - Storage tanks associated with gasoline:
    - Gasoline blending components
    - Blending tanks
    - Strategic inventory – such as alkylate storage
      - Both refiners and non-refiners
    - Distribution terminals
      - Tanks cycle from full to empty and back with each pipeline delivery cycle

Minimum Gasoline Inventory Holdings



- Limiting the draw down level for current in-service storage tanks will decrease working storage capacity, impeding operational capability of refiners and marketers
  - How would the average market-clearing price of gasoline be impacted over the longer-term?

Minimum Gasoline Inventory Holdings

- Minimum Inventory – *Reaction to requirement?*
  - Reduction of strategic inventories by non-refiners is possible
    - Traders and other non-refiners hold strategic inventory of gasoline and/or components
    - Do not necessarily have ongoing contractual obligations to supply
    - These market participants provide at-hand gasoline inventory to sell to refiners during periods of unplanned outages
    - It is possible that some or most of these participants would exit the California market – which could impact availability of strategic gasoline supplies
  - Construction of new storage tankage
    - New tankage could be constructed in response to this concept
      - How much capacity might be constructed & where?
      - What are the costs and who would initially pay?

Minimum Gasoline Inventory Holdings

- Minimum Inventory – *What would be the trigger?*
  - Types of "release" mechanisms
    - Specific price increase
      - What price – rack, spot pipeline, average state retail?
      - What is the number and over what period of time?
    - Subjective release mechanism
      - If criteria for release is too vague or has any subjective language there could be additional uncertainty injected in the marketplace
  - After the "release"
    - How much time is allowed to refill minimum inventory obligation?
    - Where would resupply come from & how might that "phantom demand" impact the marketplace?
    - What is there is another temporary supply imbalance that triggers the mechanism prior to restocking of inventories?

Minimum Gasoline Inventory Holdings

- Minimum Inventory – *Are there other "storage-related" concepts that should also be examined?*
  - Should consider examination of other "storage-related" concepts
    - Construction of new storage tanks at end-of-pipeline distribution terminals
      - Contingency planning benefit during fuel shortages
    - Incentives designed to encourage construction of new storage tank capacity
      - What type
      - Locations
      - Quantity
      - Who pays

California Forward Purchase of Gasoline

- California forward purchase of gasoline to reduce import risk preliminary concept --
  - The state buys 1-2% of all CARB gasoline used in California. The state would contract with one or more sellers to deliver the gasoline needed by the state on a forward basis, with contracts signed 1-2 months ahead of delivery.
  - Such forward contracting could reduce the price risk that a fuel importer faces when arranging for delivery of CARB gasoline, which generally takes 1-2 months from the time of the order.
  - During times of abnormally high gasoline prices, the state might want to focus such contracting on sellers who would fulfill the contract by importing gasoline from out of state.

California Forward Purchase of Gasoline

- Forward Purchase – Issues that should be examined
  - What are the structure & duration of state fuel contracts?
    - Who are the current vendors of state gasoline contracts?
    - Are fuel supplies sourced by vendors from one or several locations?
    - How do typical gasoline import cargo volumes compare to state contract totals?
  - Has forward purchasing concept been previously assessed by the state?

California Forward Purchase of Gasoline

- *What are the structure & duration of state fuel contracts?*
  - Fuel cost is indexed to OPIS posted prices
  - Regions of state are linked to specific geographic terminal racks
    - Eureka, Sacramento, Fresno, Los Angeles, Barstow, and San Diego
  - Fuel prices also include charges for LCFS and CAR valuations
  - Differentials agreed to by winning vendors range between 0.5 and 7.6 cpg
  - Current fuel contracts are 3 years in length - 05/01/2014 through 04/30/2017

Contract Cost Structure:

GASOLINE, DIESEL #2, and ETHANOL (E-85) FUELS: The contract cost will be based on four (4) factors: Region Base Market Cost (RBMC), CAR Cost Fee, LCFS Cost Fee and the Differential Cost. The following formula outlines the contract price to be paid by the ordering agency:

REGION BASE MARKET PRICE	+	CAR COST FEE	+	LCFS COST FEE	+	DIFFERENTIAL	=	COMPOSITE PRICE
(Posted daily by the Contract Administrator using OPIS data)		(Posted daily by the Contract Administrator using OPIS data)		(Posted daily by the Contract Administrator using OPIS data)		(Provided by the Supplier)		

Source: Department of General Services (DGS), Contract Users Instructions, contract number 1-14-91-02-A, Supplement 6.

California Forward Purchase of Gasoline

- *Who are the current vendors of state gasoline contracts?*
  - Two vendors are current suppliers for gasoline under the state contract

  - Not refiners nor importers of marine cargoes
  - Vendors obtain gasoline from various distribution terminals as identified in DGS contracts – not a single location
  - Multiple California refiners are likely source of this gasoline
  - Typical import cargoes of gasoline are about 300,000 barrels – about 2 to 4 weeks-worth of total statewide gasoline contract volumes
  - But imports of gasoline are normally discharged in one port while DGS contracts require delivery to over 700 locations throughout the state

California Forward Purchase of Gasoline

- *Has forward purchasing concept been previously assessed by the state?*
  - Yes, findings published in April 2003 – CEC Draft Consultant Report P600-03-007D

> State agencies weekly buy a quantity of gasoline (i.e., about one million gallons) on the order of one pipeline piece. An increase in volume of one piece per week would make some difference to the functioning of the forward market, since the daily volume is only a few pieces, but the state's trading would be unlikely to transform the market. In any case, because the state agencies need gasoline at many locations (and in small amounts), the state itself could not disperse one pipeline piece. Yet more problematic, all the state's procedures for procurement and inventory control exemplify the rigidity opposite to the flexibility needed for sophisticated trading in forward markets.

Source: "Price Spikes and Forward Markets for Gasoline", Jeffrey Williams and Jennifer Thompson

  - Are these conclusions still valid 13 years later?

Additional Questions?

Source: VisitCalifornia.com – Delta King and Tower Bridge over Sacramento River.