



California Crude Oil Import & Infrastructure Forecast

Joint Transportation and IEPR Committee Workshop
Demand and Fuel Infrastructure Requirements
Sacramento, California
August 24, 2009

DOCKET

09-IEP-1K

DATE AUG 24 2009

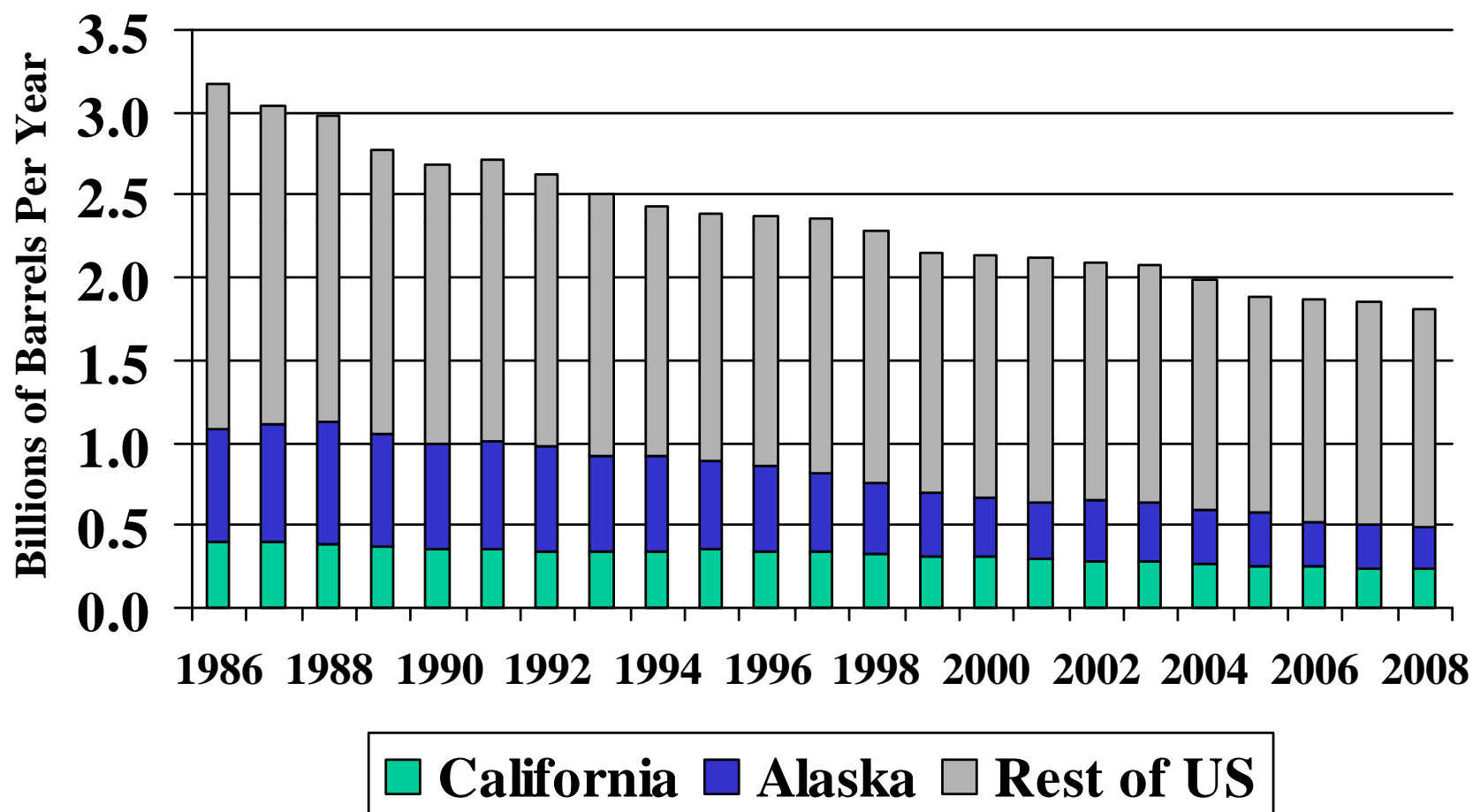
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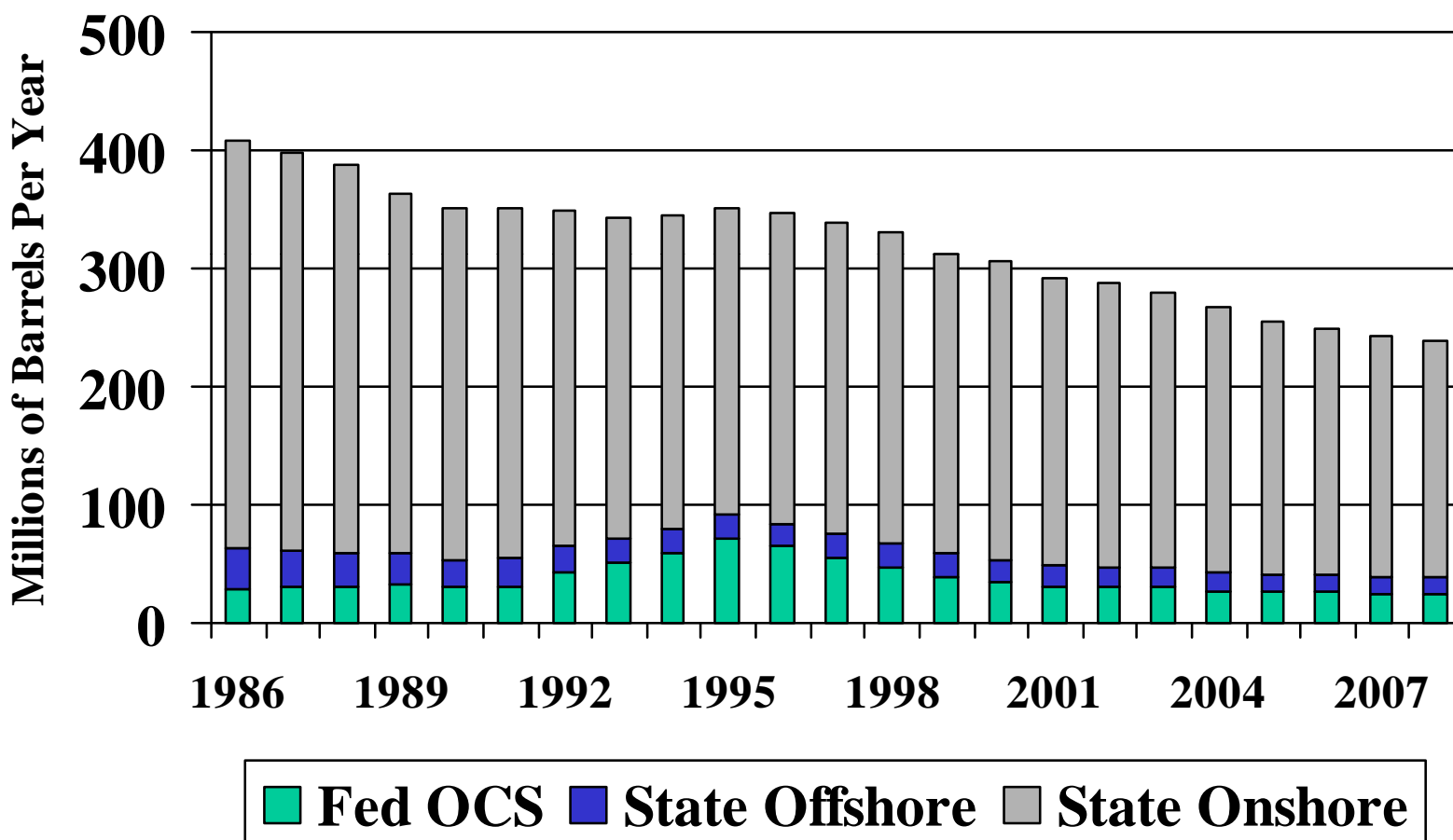
United States Crude Oil Production 1986 to 2008



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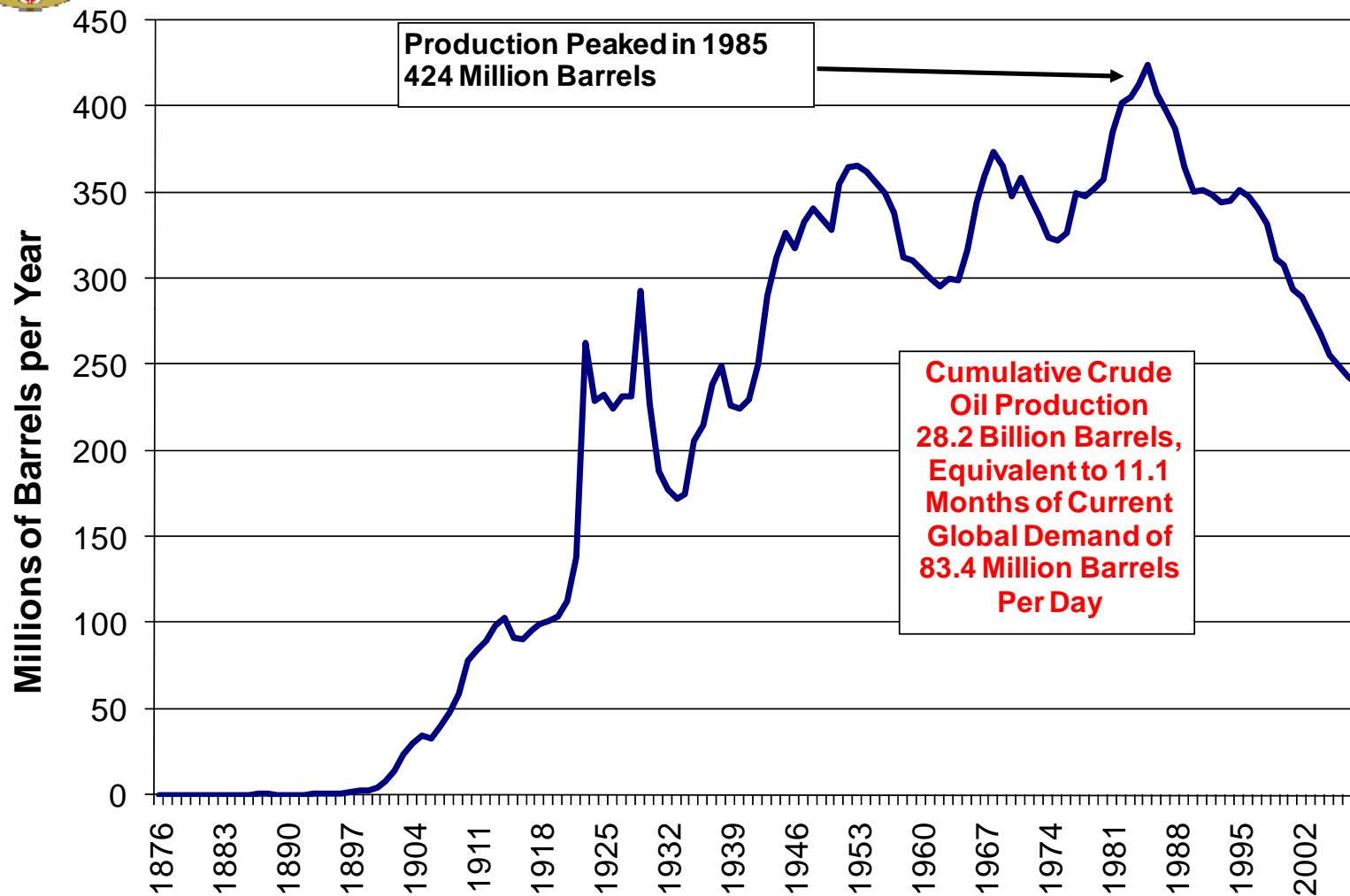
California Crude Oil Production 1986 to 2008



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California Crude Oil Production 1876-2008



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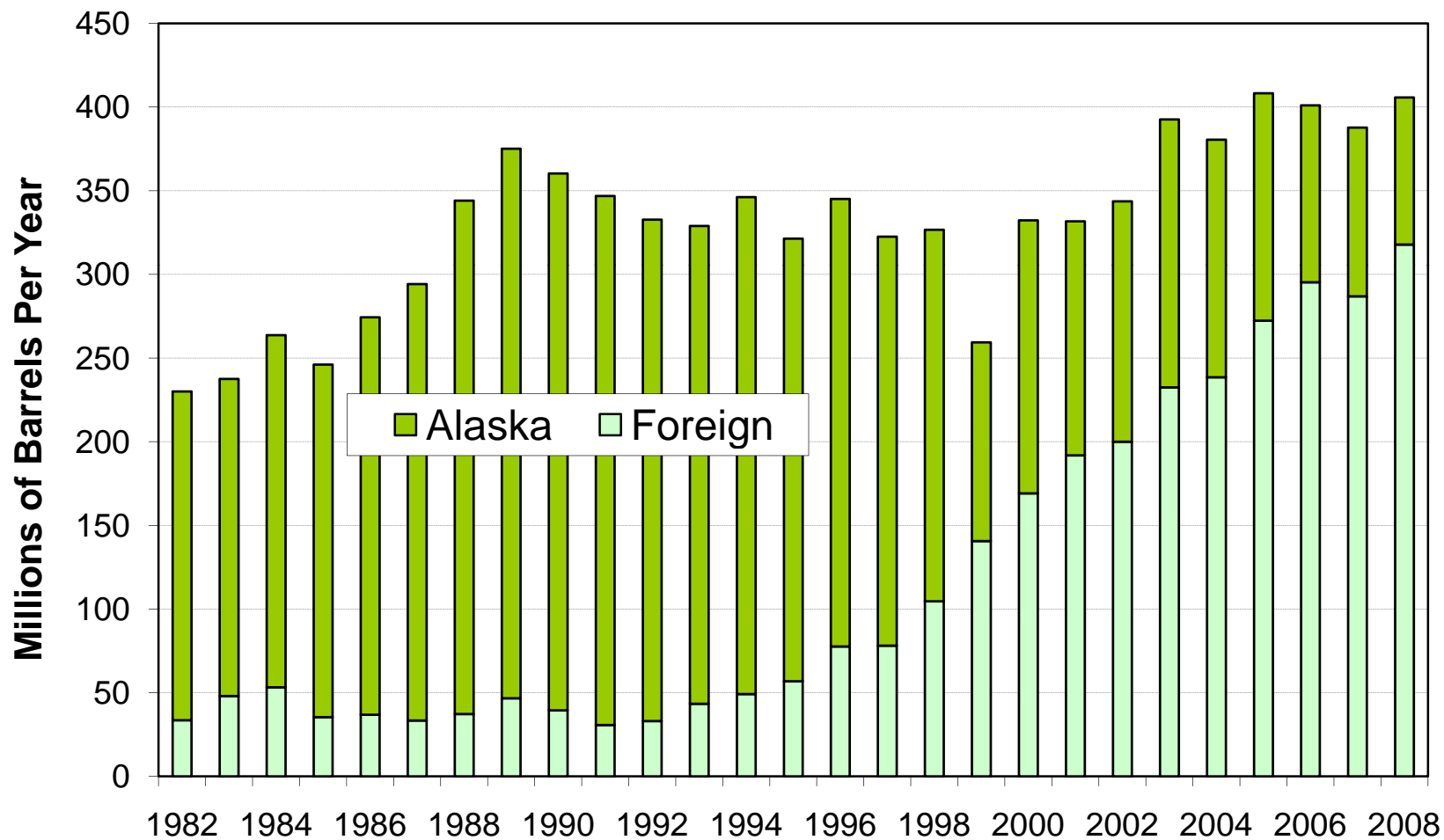


Recent Crude Oil Production Trends

- Global crude oil production was 31.7 billion barrels in 2008, roughly 86.8 million barrels per day
- 2008 U.S. crude oil production was 1.8 billion barrels or 4.9 million barrels per day
- CA crude oil production in 2008 was 239 million barrels or 652 thousand barrels per day
- California crude oil production is expected to continue to decline, despite higher prices and increases in drilling activity
- Declining U.S. domestic oil production will most likely need to be replaced with increased imports of crude oil from foreign sources



Volume of Foreign Imports 1982 - 2008



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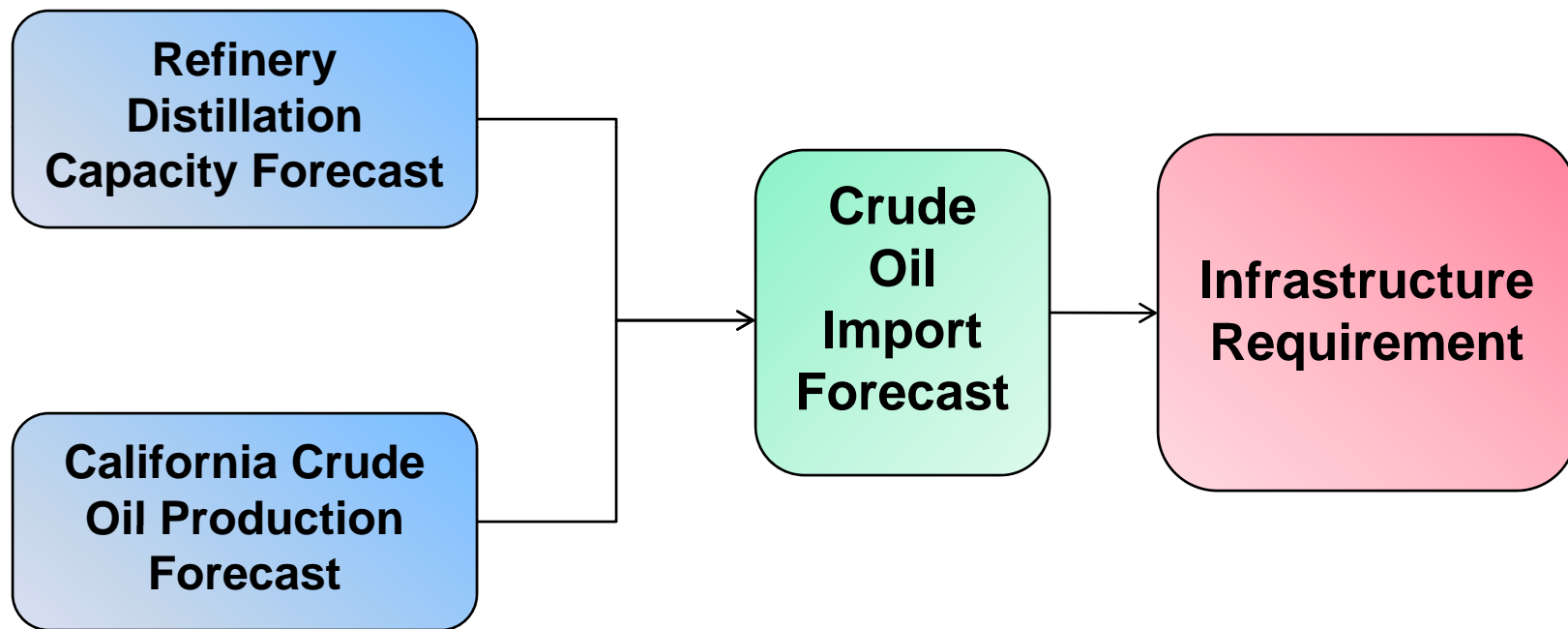


California Crude Oil Imports – Historical

- Total imports of crude oil have increased by 24% between 1998 and 2008
- Imports of Alaska crude oil declined a total of 60% between 1998 and 2008
- The largest increase has been for foreign crude oil imports
 - 11.7% per year increase
 - Over 3 times greater in 2008 compared to levels of 1998
- What is the outlook for crude oil imports for California and what are the primary factors influencing the forecasts?

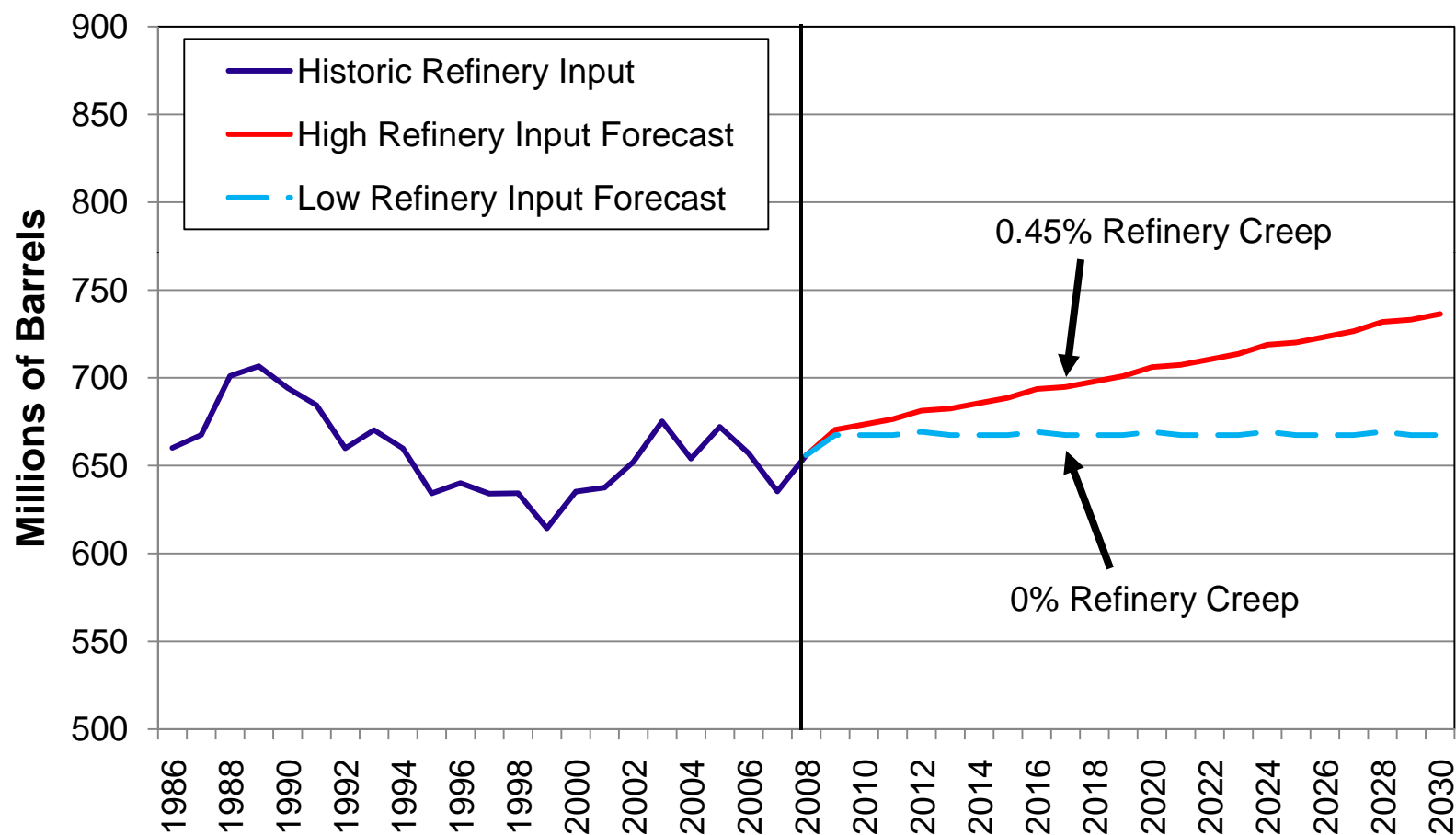


Crude Oil Import Forecast - Approach





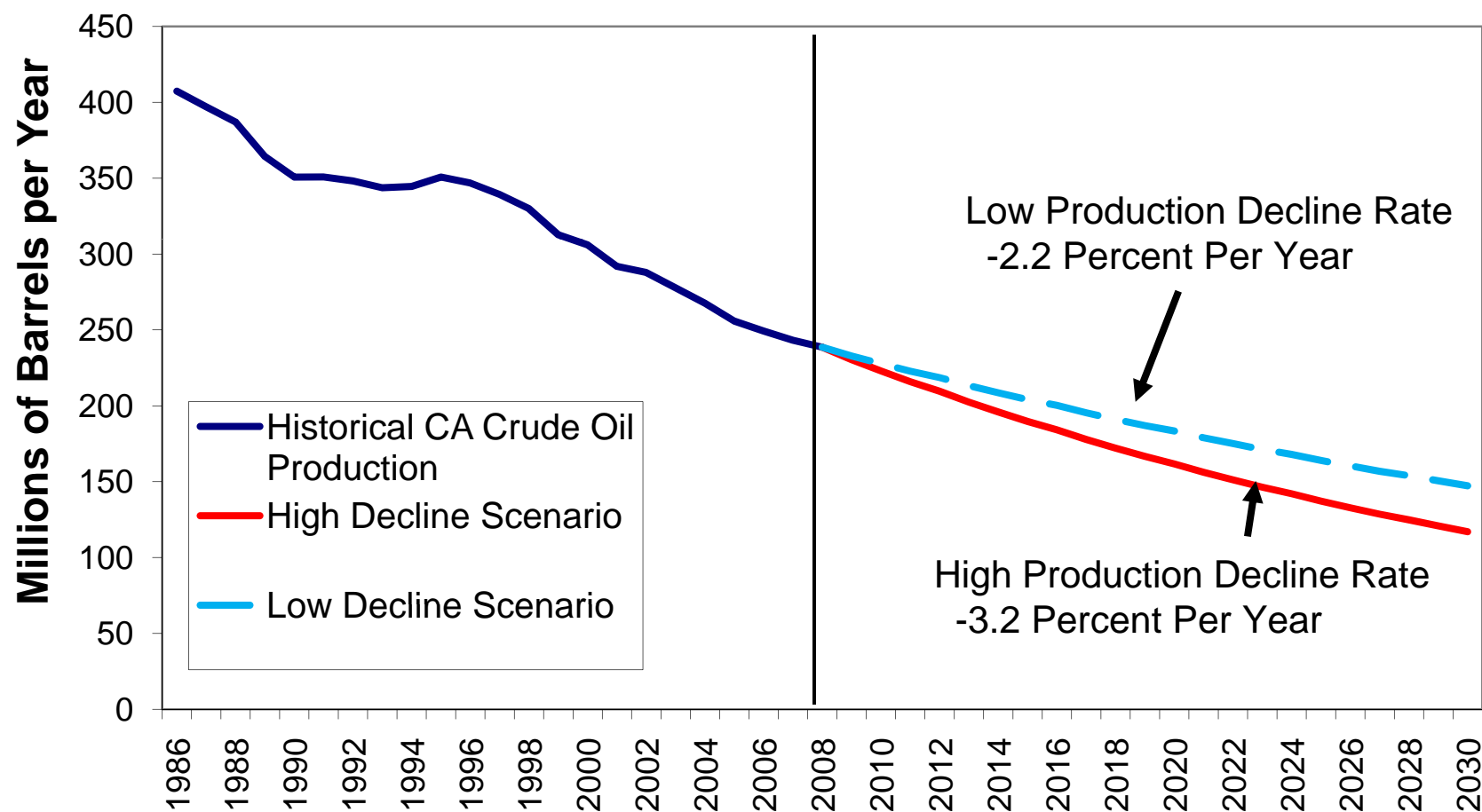
California Refinery Input Forecast 2009-2030



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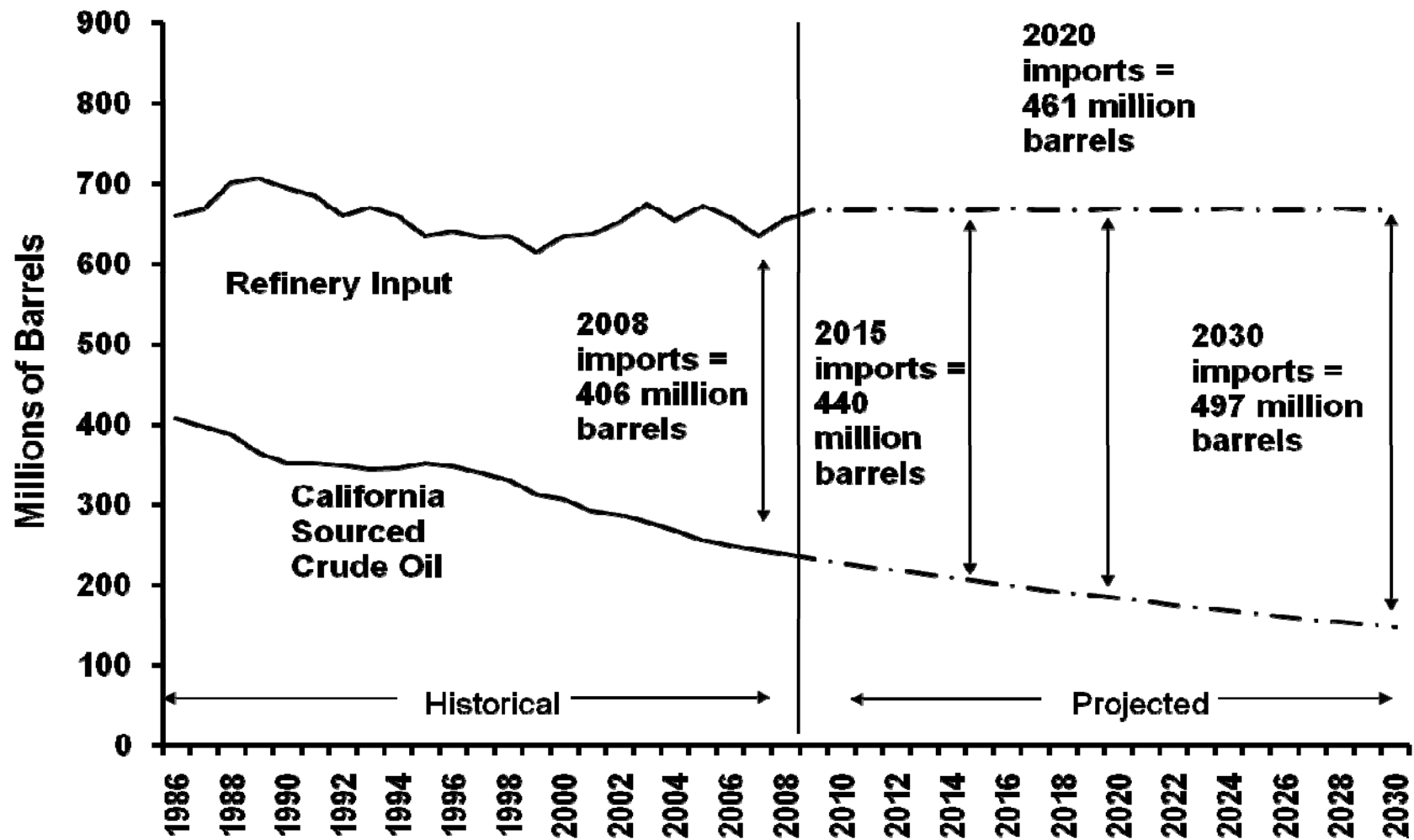
California Crude Oil Production Forecast 2009-2030



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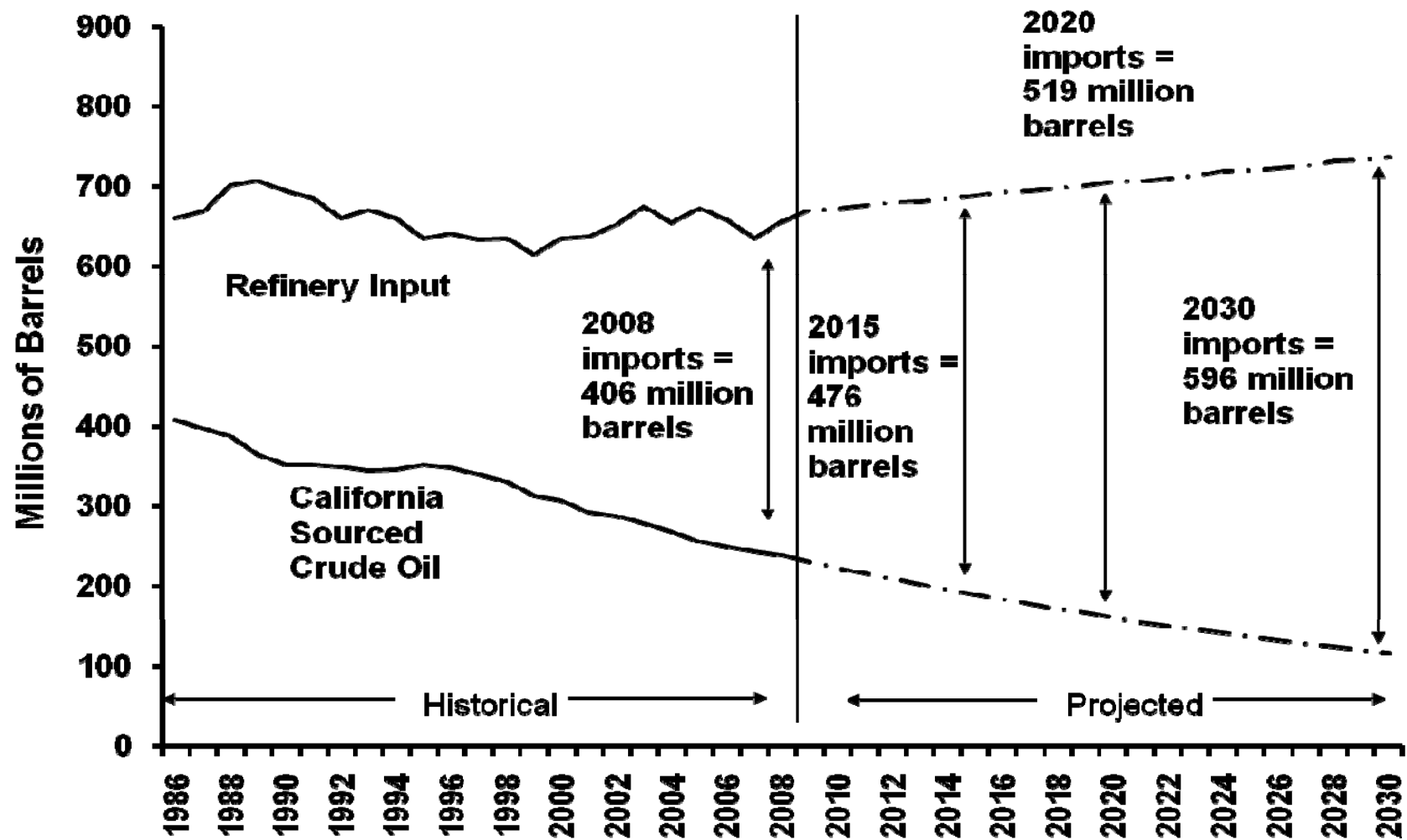
California Crude Oil Imports – Low Forecast



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California Crude Oil Imports – High Forecast



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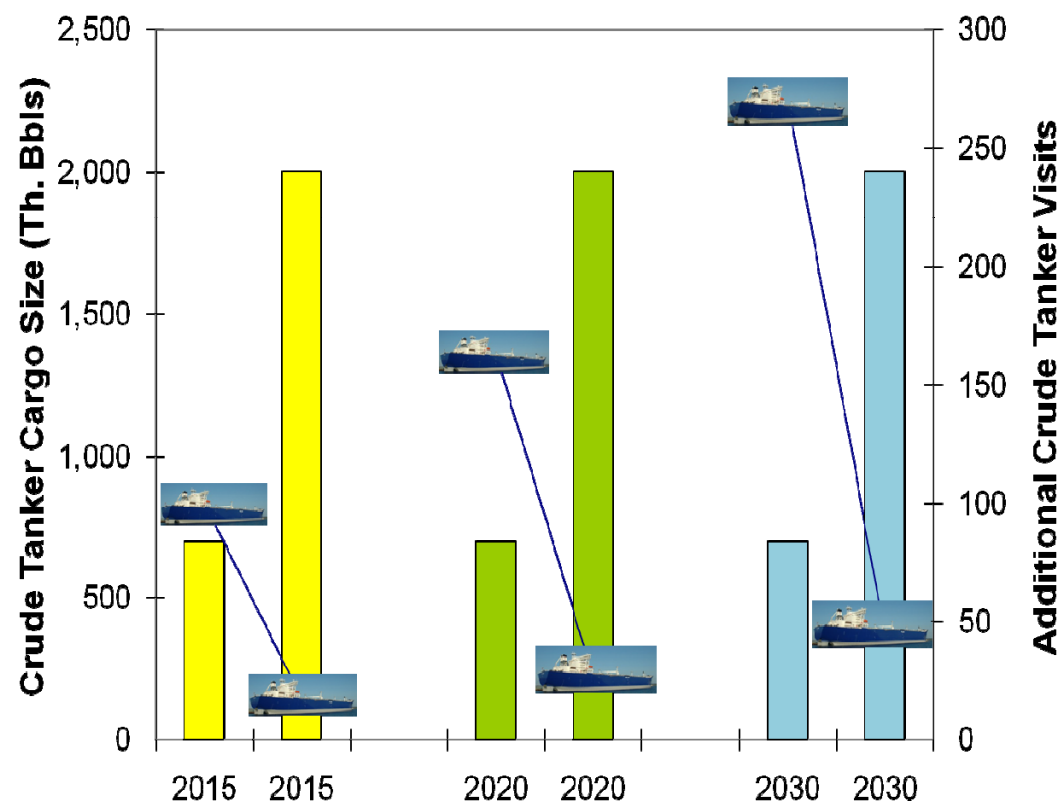
California Crude Oil Imports – Forecast

- Crude oil imports are forecast to increase in California due to:
 - Continuing decline of California crude oil production
 - Gradual expansion of the capacity of California refineries to process crude oil – referred to as “refinery creep”
- The lower estimate for increased crude oil imports assumes that crude oil production declines by 2.2% per year & there is no expansion of refinery capacity
- The larger estimate for incremental crude oil imports assumes that crude oil production declines by 3.2% per year & refinery capacity increases at a rate of 0.45% per year



Incremental Crude Oil Tanker Visits

- Both High and Low import forecasts will result in increased tanker visits
- California is forecasted to see 46 to 272 additional visits
- High variability in the number of visits is due to storage capacity differences between VLCC and Aframax tankers





Crude Oil Storage Capacity

- Forecasts for additional storage tank capacity assumes that existing infrastructure is operating at or near capacity
- Storage capacity forecasts are dependent on cycling rates:
 - The higher storage need forecast assumes a rate of 1 million barrels of storage per 23 million barrels of import
 - The lower storage need forecast assumes a rate of 1 million barrels of storage per 12 million barrels of import
- Staff forecasts additional storage tank capacity requirements in the range of 2.4 to 9.5 million barrels by 2020, and 4 to 15.9 million barrels by 2030



Sources of Uncertainty in the Forecasts

- Can technological advances and/or expanded access to offshore reserves slow or halt the decline in Californian crude oil production?
- Will new crude oil import facilities be completed in time to maintain an adequate supply of crude oil to California's refineries?

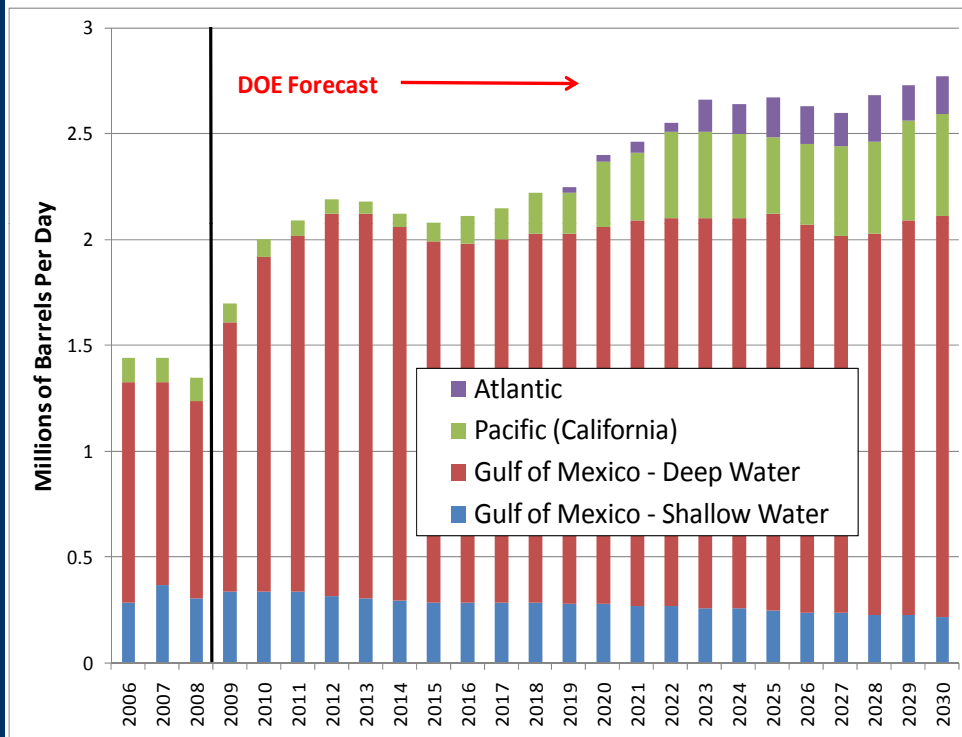


Federal OCS Drilling Scenario

- An estimated 5.8 to 15.8 billion barrels of Undiscovered Technically Recoverable Resources (UTRR) crude oil exist off the shore of California, over half in federal OCS
- Mineral Management Services (MMS) estimate that 53% to 78% of those resources are economically recoverable based on crude oil prices between \$60 to \$160 per barrel
- Significant impediments to moving forward:
 - 5-year Program
 - Planning for a Specific Sale



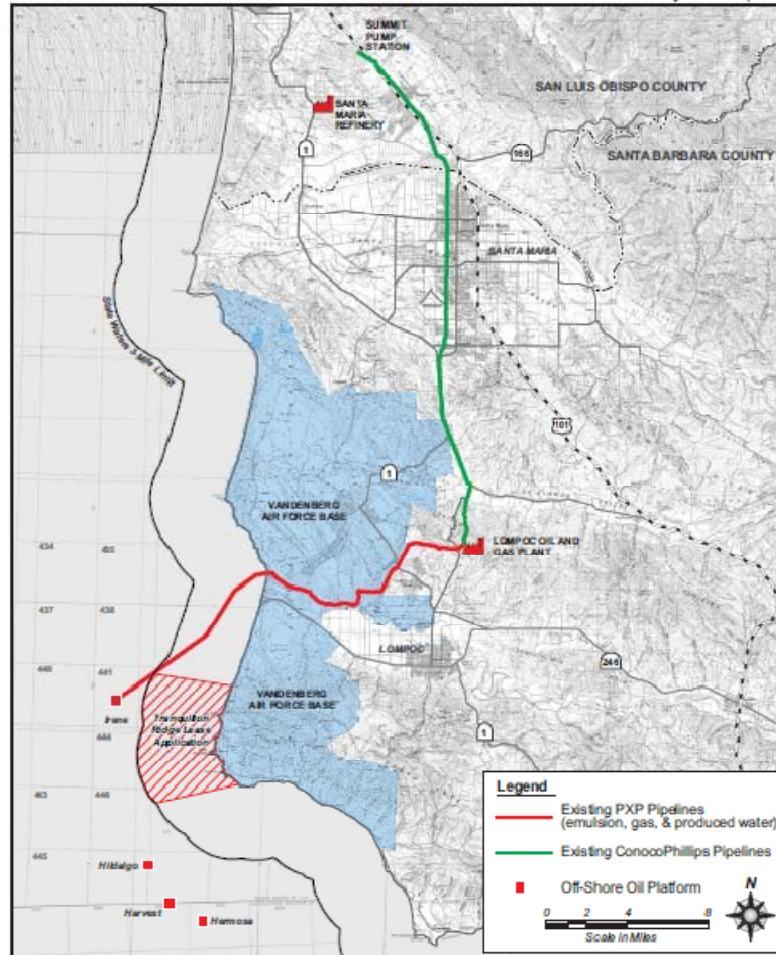
OCS Crude Oil Production Forecast No Moratoria



- DOE estimates new production associated with the moratoria areas to begin 2015
- 74% of this increased production is forecasted to originate from the California OCS area
- Under the 2.2% crude oil decline rate & no capacity growth total crude oil imports have the potential to fall below 2008 levels



Tranquillon Ridge





Questions and Comments

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