

Transportation Fuel Infrastructure Issues - Overview

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Overview

- Infrastructure and Demand Integration
- Retail Fueling and Recharging Infrastructure
- Lunch
- *Continued* Retail Fueling and Recharging Infrastructure
- Renewable Fuels: Supply, Import, and Distribution
- Crude Oil Import Forecast and HCICO Screening
- Public Comment



2011 Integrated Energy Policy Report

Senate Bill 1389 (Bowen, Chapter 568, Statutes of 2002) requires the California Energy Commission to prepare a biennial integrated energy policy report that contains an integrated **assessment of major energy trends and issues** facing the state's electricity, natural gas, and **transportation fuel sectors** and provides policy recommendations to conserve resources; protect the environment; ensure **reliable, secure, and diverse energy supplies**; enhance the state's economy; and protect public health and safety.



Fuels and Transportation Division

- Develop transportation fuel price and demand forecasts for policy analyses
- Produce California transportation electricity demand forecasts
- Quantify regional supply and demand trends
- Evaluate infrastructure adequacy issues considering projected demand scenarios
- Evaluate sources and production capacity of transportation fuels



Transportation Fuel Energy Security

Diversification

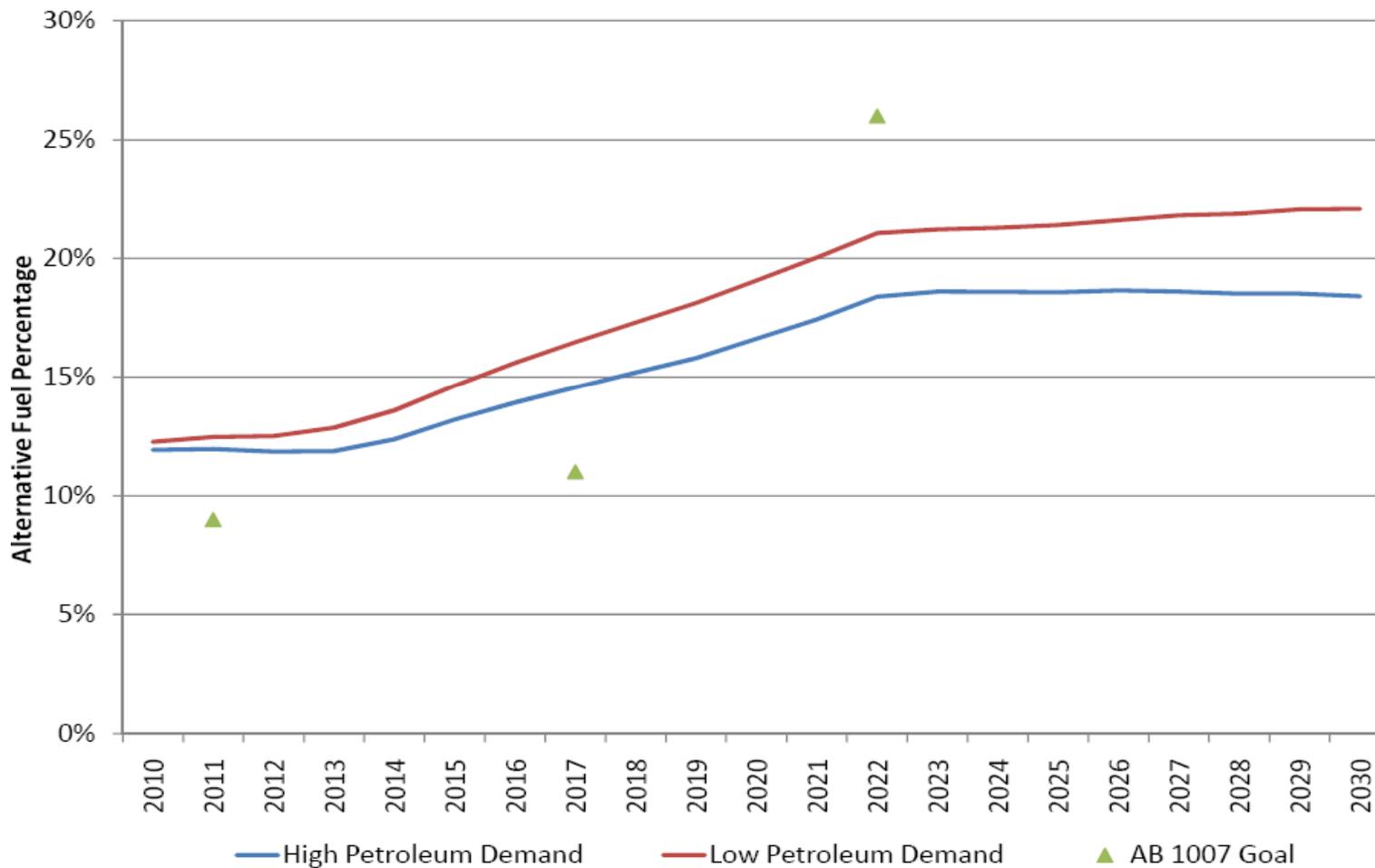
Diversifying the sources of fuels used in the transportation sector reduces the exposure of the transportation market to being dependent upon a single fuel source. However, transitioning to a fuel source with limited supply capacity, high price volatility, or unforeseen impacts may lead to their own set of challenges.

Fuel Source

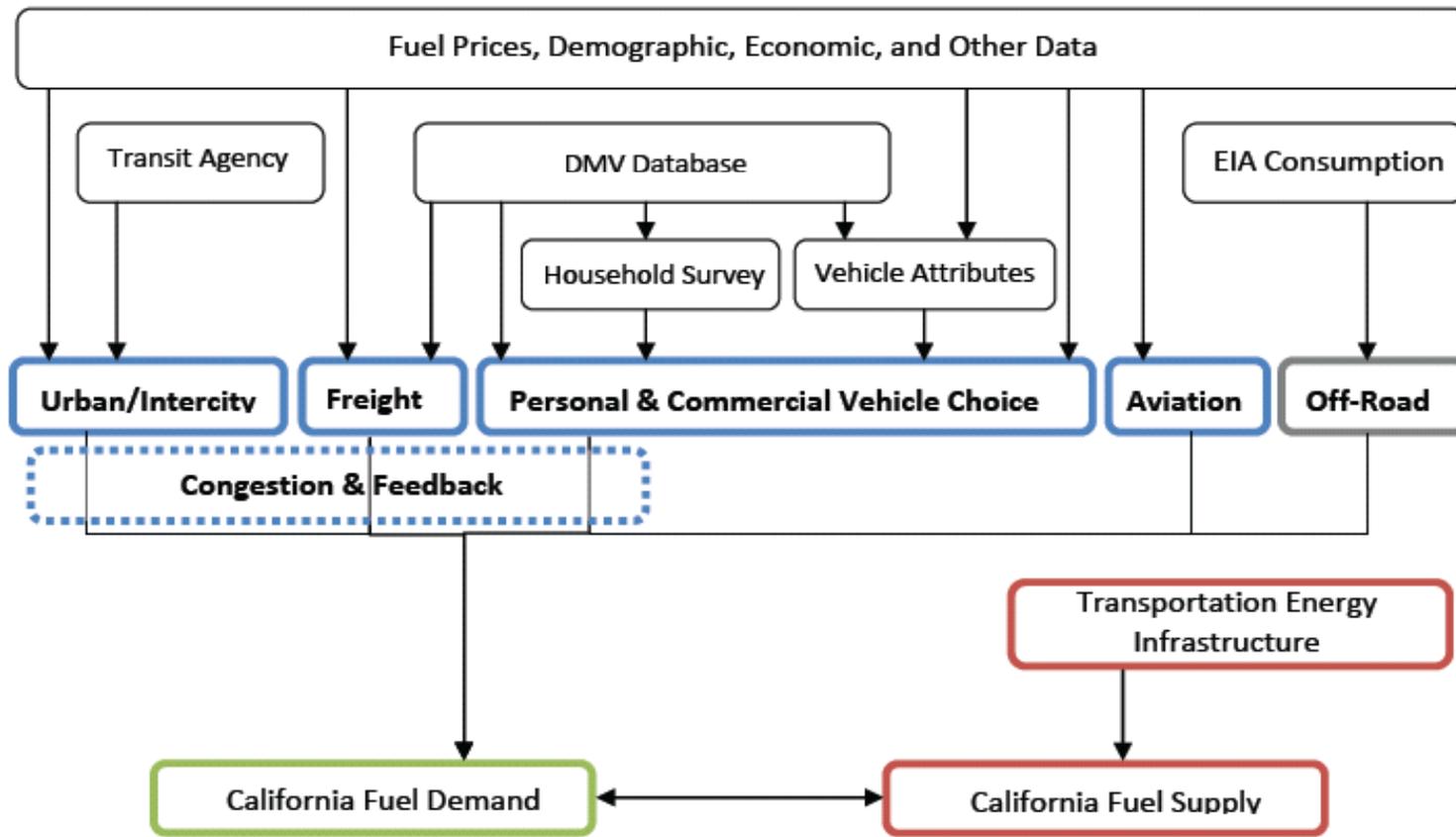
Obtaining transportation fuels from sources which are reliable, stable, and meet the California fuel specifications is beneficial but may lead to added complexity to transportation fuel distribution.



AB 1007 Alternative Fuel Goal Comparison to IEPR 2009



Data Flow to Transportation Energy Demand Models



Transportation Fuel Demand Scenario Methodology

Two step approach:

- 1) Develop initial modeling demand based on our defined scenarios and inputs
- 2) Post-processing to adjust demand for fuel selection, sectors not included in demand models, and policies



Model Post-Processing Activities and Policies

Fuel Selection and Sectors

- PHEV base electricity consumption
- E85 base consumption
- Off-road fuel consumption

Policies

- Zero Emission Vehicle program compliance
- Federal Renewable Fuel Standard
- California Low Carbon Fuel Standard



Refueling & Recharging Infrastructure

- Over 10,000 locations throughout California that dispense about 20 billion gallons of transportation fuels each year
- Increased use of renewable and alternative fuels will require adequate development of the retail station infrastructure to help ensure sufficient distribution throughput capability
- However, fuel supply and vehicle populations are necessarily interrelated elements that must also be sufficient or potential problems could emerge
- There are a number of issues that need to be addressed at the retail distribution level



Retail Infrastructure - Gaseous Fuel Issues

Key Questions

- What are the historic patterns for the purchase and use of natural gas vehicles and how will future trends in vehicle usage influence the need for infrastructure?
- What is the status of the clean vehicle trigger for hydrogen retail availability? What minimum number of hydrogen-fueled vehicles and anticipated timing will necessitate the investment in hydrogen retail fueling infrastructure?
- What are the current costs associated with the installation of hydrogen fueling at an existing retail site, as well as for a new retail facility dedicated solely to hydrogen vehicles?
- What are the costs for hydrogen vehicles compared to non-hydrogen makes and models?
- What limitations and opportunities exist for the installation of hydrogen refueling infrastructure at existing retail sites?



Electric Recharging Issues

- There are several important issues that will need to be addressed and specific barriers overcome to better ensure that the recharging infrastructure is adequate to enable an expanded use of PHEV and full electric vehicles
- Key Questions
 - What are the estimated costs, timing, vehicle population requirements, and distribution of recharging infrastructure between private residential and public facilities?
 - What portion of new electric vehicles sold into the market will be sold to fleets as opposed to residential-based consumers?
 - To what extent will the forecasted installation and use of public-charging stations impact peak electricity demand loads?
 - Which stakeholders will accrue carbon credits – electric utilities, vehicle manufacturers, recharging equipment providers?



Retail Infrastructure - Ethanol Fuel Issues

- Higher use of ethanol in the form of E85 will require more retail dispensers and flexible fuel vehicles – but there are no requirements for these higher levels
- Staff will estimate a range of FFV new vehicle sales that will be necessary to consume a sufficient quantity of E85 to meet federal and state mandates
- Key Questions
 - What are other types of automotive developments that could possibly conflict with a scenario of greatly expanded FFV availability, such as higher Corporate Average Fuel Economy standards, stricter evaporative emission control requirements, increased electric vehicle sales obligations, and greater consumer demand for Plug-in Hybrid Vehicles?
 - What type of business model can be used to help ensure that the market will respond at the necessary pace and quantity of E85 dispensers?



Retail Infrastructure - Biodiesel Fuel Issues

- Biodiesel is able to mostly utilize the existing retail distribution structure
- Some questions may still need to be answered concerning biodiesel and underground storage tanks (USTs)
- Key Questions
 - What is the status of allowing biodiesel blends in excess of B5? What are the barriers and what is the anticipated timing for enabling B20 use in USTs?
 - What is the current limit of biodiesel use for light, medium, and heavy-duty diesel engines? If less than B20, can this warranty issue be resolved?
 - How will the ARB's recent analysis associated with biodiesel and increased NOx issues impact the use of biodiesel in California? What options remain for obligated parties to comply with the diesel fuel portion of the LCFS?

