

**Written Testimony of Tim Olson  
Manager, Transportation Energy Office  
California Energy Commission  
Before the House Committee on Natural Resources  
Subcommittee on Energy and Minerals**

**April 4, 2014**

Chairman Lamborn and Members of the Subcommittee, thank you for the opportunity to provide testimony today about California's transportation energy profile and potential changes in the near future that impact the use of petroleum fuels. The California Energy Commission is a state government agency with numerous responsibilities, including ongoing tasks to forecast transportation fuel demand, assess petroleum supply and infrastructure requirements, and evaluate options to displace petroleum fuels and diversify California's transportation energy system.

My name is Tim Olson and I serve as the Manager of the Energy Commission's Transportation Energy Office. I joined the Energy Commission over 25 years ago, serving in numerous managerial and policy advisor positions that provided an opportunity to understand a complex and critical transportation market segment of California's economy. I direct a data rich office that receives confidential information from California oil refineries, fuel distribution centers, 9,700 retail gasoline station owners and many aspects of the petroleum industry supply chain. We also conduct surveys of consumers and businesses to understand changes in fuel consumption and other travel behavior characteristics. Our work also assesses the growth of non-petroleum transportation options, such as natural gas, biofuels, electric transportation and hydrogen fuels. We summarize information in an aggregate form to avoid revealing confidential data from individual companies and include our analysis in reports to the Governor and Legislature, most notably the biennial Integrated Energy Policy Report.

California is experiencing several new circumstances and fuel trends, indicating significant change in our near future. Prior to 2006, petroleum supplied nearly 98% of the state's transportation energy from California oil field production, Alaska and foreign imports – primarily the Middle East. Today, crude oil production from California and Alaska has declined while foreign imports have increased to over 50% of the state's supply of roughly 600 million barrels per year. Imports from Alaska and foreign sources are delivered to California by marine vessel. However, California's crude oil sources appear to be shifting to new supplies spurred by hydraulic fracturing and other extraction technology advances in North Dakota and other states, and development of Canadian oil sands. Shipments of these new resources are increasing by rail to California or potentially by rail shipment to the state of Washington and barged to California. Crude oil delivery by rail amounted to one million barrels in 2012 and six million barrels in 2013, less than 1% of California's total consumption. We are aware of proposals for at least six new crude oil storage and rail/barge offloading terminals in California near refineries that if constructed, would have the capacity to cover 25% of our crude oil used in producing gasoline, diesel and other

refined products. Because of the characteristics of crude oil from the Canada and North Dakota, increased use of these sources in California would displace Alaskan oil and foreign imports.

The development of the Monterey shale formation in California, while offering significant production potential of 6 billion barrels of oil, has not progressed primarily because the complex geology of the formation makes it expensive to develop. It should be noted that the historic decline in California's crude oil production has abated a bit and production has become level as existing heavy oil fields are extracting more crude oil because the world commodity price makes it economic to do so.

California's 26 million cars and light trucks used 14.6 billion gallons of gasoline in 2013 and we expect gasoline demand to decline to 12.7 billion gallons in 2020 as a result of improvements in corporate average fuel economy standards (CAFE), requiring automakers to achieve a fleet average of 35.5 miles per gallon in 2016 and 54.5 miles per gallon by 2025. We see this trend reflected in downsizing of engines and light weighting of vehicles in several new models. Furthermore, the California Air Resources Board's (ARB) aggressive zero emission vehicle mandate and Governor's Executive Order compel the state to ensure infrastructure is in place for one million electric and hydrogen vehicles in 2020 and require automakers to provide 1.5 million of these zero emission vehicles for sale by 2025. The additional increment in 2025 would represent 15% of all California passenger car sales in that year. Studies completed by the National Academy of Sciences and Oakridge National Laboratory in 2013 assert that electric and hydrogen vehicles will be equal in cost or less expensive than internal combustion engine vehicles by 2030 because of light weighting of more components than in gasoline and diesel cars. Electric and hydrogen vehicles are currently 2-3 times more efficient than internal combustion vehicles on an energy equivalent per mile travel comparison.

One million heavy duty trucks and buses comprise 4% of California's vehicles, but consume 17% of the total on-road transportation fuel. Diesel fuel is consumed in 70% of these vehicles and diesel and jet fuel are expected to grow at a rate of 1% - 2% per year, spurred by increased freight movement, introduction of numerous new diesel car models and other factors. However, several new factors are influencing potential changes. Diesel trucks servicing the ports of Long Beach and Los Angeles move 40% of all container traffic coming in and out of the United States. They are located in the South Coast Air Quality Management District, which along with the San Joaquin Air Quality Management District have been designated as extreme violators of pollution control for nitrogen oxides, particulate matter and other ozone forming compounds from truck idling and traffic congestion. This has led to high incidences of asthma and other respiratory issues for citizens living in these areas. The ports and air quality agencies have begun development of plans to encourage use of zero and near zero emission vehicles by 2023 through incentives and regulations to address this problem. Additionally, hydraulic fracturing has stimulated development of new natural gas resources in the United States, leading to a supply surplus and stabilizing prices at a level that is \$1.00 to \$1.50 below diesel fuel prices on an energy equivalent basis. Most experts believe natural gas prices will remain stable at a moderately low level for 7-10 years. This fuel price advantage combined with the introduction of natural gas engines and trucks by fourteen manufacturers provide cost competitive non-petroleum options for long haul trucks, refuse

trucks, transit buses and other types of vehicles. Economy of scale manufacturing is reducing the differential cost of natural gas trucks and buses compared to diesel counterparts and could spur a significant shift to natural gas as a transportation fuel.

California refineries may need to re-configure their facilities to reflect the change in demand for different gasoline, diesel and jet fuel and growth of non-petroleum options. As a consequence of multiple factors, we expect a decline in California's net crude oil demand to produce petroleum products for California's use over the next 10-15 years. However, California refineries also produce petroleum products for Arizona and Nevada and may be increasing exports of the refined products to international markets.

Federal and California laws, regulations and incentives designed to reduce greenhouse gas emissions, reduce transportation demand, and increase the development and use of alternative fuels as a petroleum displacement have begun to show modest gains in the transportation energy market and could be poised for significant growth. The federal Renewable Fuels Standard and tax incentives combined with the ARB's Low Carbon Fuel Standard, the California Cap and Trade system, the Zero Emission Vehicle mandate and \$100 million - \$200 million per year allocation of state incentive funds by the Energy Commission and ARB have stimulated development of numerous low carbon fuel options and zero emission vehicles. By the end of 2013, alternative fuels represented 7 percent of total transportation fuel consumption and the Energy Commission's analysis indicates each alternative fuel option could increase three-fold by 2020. Furthermore, low carbon biofuels in gasoline and diesel blends will both displace petroleum and reduce the carbon intensity of transportation fuels. This plausible growth is significant because it means that California could displace 20% or more of the petroleum fuels with alternative fuels to achieve petroleum displacement and greenhouse gas emission reduction goals by 2020, while increasing California jobs and tax revenue from new projects.

Petroleum fuels will remain a dominant contributor to California's transportation energy supply and the state and local government laws, regulations and policies are in place to compel a more diverse transportation fuel system. Multiple changes in transportation energy supply and demand require close scrutiny of changes in the petroleum supply sources, how crude oil is transported to California and significant challenges to ensure affordable and sustainable mobility for California's consumers and businesses.

Chairman Lamborn and Members of the Subcommittee, thank you again for this opportunity to appear before you today. I will be happy to answer your questions.