

# 2016 ASCE O.C. Citizen’s Guide Infrastructure Report Card

## Summary for OIL

	2002	2005	2010	2016
<b>Oil</b>	-	-	-	B-



California’s isolation as an “energy island” with the Pacific Ocean on one side and the Sierra Nevada Mountains on the other side, and fuel differentiation are documented problems for California and these problems become much more apparent when outages and/or shocks to the system occur. As California’s fuel standards become more differentiated from surrounding states and the rest of the nation, it will likely become more difficult to find relief sources that are compliant with state regulations. This means that Californians are likely to become more vulnerable to price surges if there are supply outages. The state’s growing population—which will lead to continuous demand for transportation fuels—combined with potential for disruption to

the fuel supply infrastructure from such things as earthquakes and other disasters underscore the long-term likelihood of such price surges in the future.

Although the California population continues to grow, the number of operating refineries in California has been decreasing over the last few decades. Generally, the smaller refineries have been shuttered as a result of regulatory requirements.

## **Evaluation and Conclusions**

The transportation fuels needs of Orange County are manufactured from crude oil by the in-state manufacturers in the oil infrastructure system receives a grade of B-.

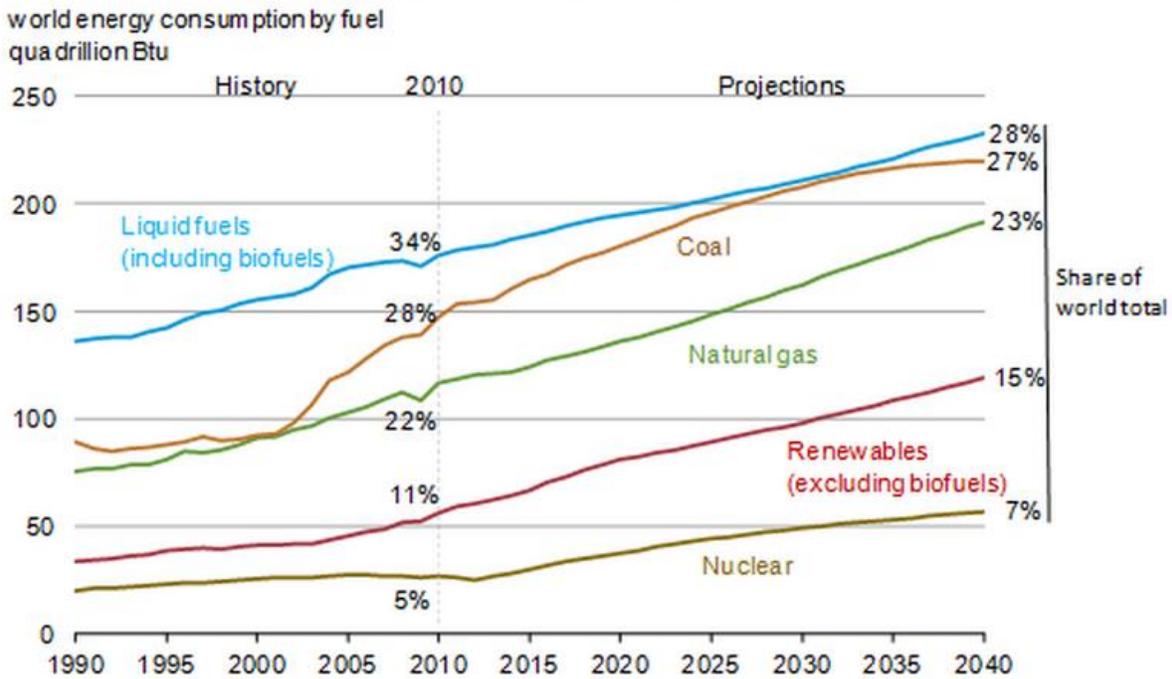
This reflects a concern that Orange County receives 100% of its transportation fuels needs from manufacturers located outside of Orange County. A lower grade is probable in the event one of the few remaining in-state manufacturers decides to opt out of the California business environment. The concern is further complicated by the fact that California is an energy island that imports the majority of its crude oil needs from foreign countries and Alaska by tanker ships into California ports to support the California manufacturers of our transportation fuels, and that virtually no other State or Country can provide Orange County's needs for transportation fuels in a timely manner.

Orange County's industries and infrastructure systems are dependent upon energy from the oil and gas industries for their existence. It is recognized that currently there are many critical infrastructure systems from transportation to water purification, electric power stations and communication networks that are mainly dependent on fossil fuels.

There are currently 32 million vehicles registered in the State of California, which has a current population of 38 million people. Similarly, there are 2.5 million vehicles registered in Orange County, which has a current population of 3.1 million residents. The collective capacity of the current in-state manufacturing appears stable as the future need for gasoline demand is projected to decline slightly from the current 40,000,000 gallons per DAY mostly as a result of more fuel efficiencies, and a slight impact by the 3% of vehicles that run on electricity or other alternative fuels.

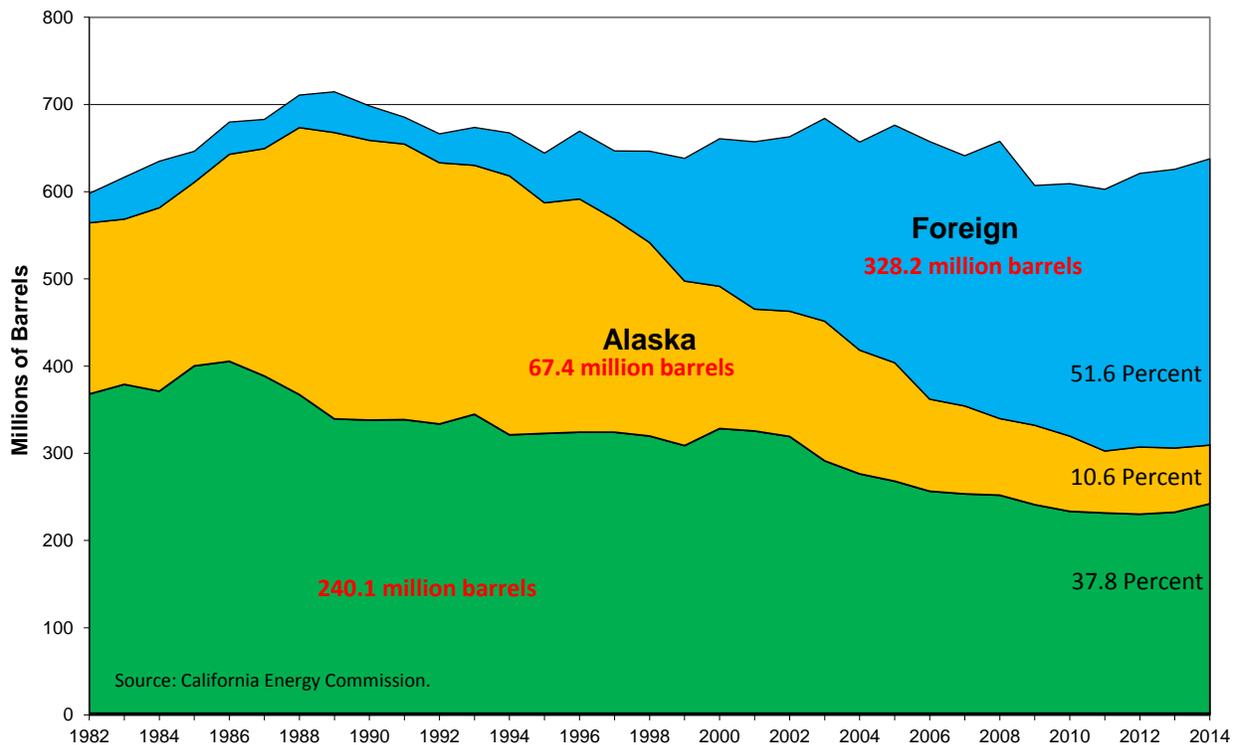
According to American Fuel & Petrochemical Manufacturers' (AFPM) Occupational Injury & Illness Report total recordable incident rate for both company employees and onsite contractors working at petroleum refining facilities was 0.5 incidents per 100 full time employees.

**Figure 2. Renewable energy and nuclear power are the fastest growing sources of energy consumption**



Source: EIA, International Energy Outlook 2013

While there has been a growing effort in recent years in moving towards renewable sources of energy such as solar, wind, and biomass, fossil fuels are still the backbone of our current economy. Worldwide there is an increase in nuclear power to meet energy consumption growth requirements, but in California we've had a big drop in energy supplied by nuclear due to the closure of the San Onofre Nuclear Generating Station (SONGS). Thus there will be more reliance in California placed on fossil fuels and renewables to meet the forecasted energy outlook.



California currently imports more than 50% of the crude oil needed (by the in-state manufacturers of California’s transportation fuels) via ships from foreign countries and Alaska. This is because there are no pipelines coming into California from other States. However, there is a concern about meeting this demand as crude oil production and shipments from Alaska on the decline and the difference may need to be met by importing more foreign oil. Historic trend in sources of oil to California refineries (source: California Energy Commission)

Orange County receives 100% of its demand for transportation fuels of gasoline, diesel, and jet fuel from California manufacturers located throughout California. Those California based manufacturers are dependent on the supply of the raw product crude oil to support their manufacturing processes. Few other manufacturers of transportation fuels, outside of California, manufacture California fuel blends, thus the reliability of supply to Orange County for transportation fuels and other fossil fuel products has been impacted by the fact that California is an “energy island” that can experience periodic transportation fuel price spikes resulting from significant unplanned refinery outages. Continued unimpeded access to marine terminals for importing additional transportation fuel supplies in the aftermath of significant unplanned refinery outages, as well as to maintain an adequate and growing import capacity for crude oil is essential to avoid potential constraints that can lead to fuel shortages and significantly higher prices for gasoline and diesel fuel.

## **Public Policy Considerations**

### *The Economy*

The ongoing and future needs of Orange County are a balance of different sources of affordable, plentiful, reliable, accessible and dependable supplies of energy. Therefore, regulators and community leaders need to think broadly to find solutions across the entire energy system, inclusive of renewables, electricity, and fossil fuels to meet California's ambitious environmental goals without severely impacting the economy.

California has always been a leader in the fight against global climate change as evidenced by California's flagship climate change policy Assembly Bill 32, the Global Warming Initiative, which was signed into law in 2006. It is estimated the California's contribution to the world's greenhouse gases is currently at or below one percent (1%).

Both solar and wind energy provide on-and-off intermittent power to the electric grid. This unfortunately is not adequate at this time for the current 24-hour, 7-days-a-week life style we are accustomed to in terms of our energy consumption. The major advantage with the use of renewable energy is that it is renewable. Even more importantly, renewable energy produces little or no waste products such as carbon dioxide or other chemical pollutants, so it has minimal impact on the environment. There are however existing challenges with renewable energy sources such as requiring large amounts of real estate required and their proximity to the end users. It is difficult to generate the quantities of electricity that are as large as those produced by traditional fossil fuel generators.

In the final analysis, all of the aforementioned factors have to be taken into considerations to produce a balanced approach to our energy consumption in Orange County.

### **Resiliency**

The foreign oil production is currently at more than 50% of California's needs and increasing annually to make up for the decreasing production in California and Alaska. Imported crude oil is delivered to California ports via foreign tankers. The availability of abundant conventional energy supplies is what drives the economy that funds the technologies for affordable renewable energy and alternative fuels and improving the efficiencies of every infrastructure sector and business sector that are the basis of our economy and standard of living.

Expanding California's growing reliance on others in the world for much of the California crude oil demands and products manufactured from crude oil to meet the needs of California's energy island's growing population, would result in transferring the responsibility for California's energy island supply requirements to other States or Countries which have less stringent environmental laws than California with resulting increases in greenhouse gases and the increases in cost for Californians from imports from afar.

The resiliency to disruptions to manufacturing, is driven by timely supplies of crude oil to California. Crude by rail from other States would enhance the resiliency for the supply of crude oil. The planned and unplanned turnaround periods that are disruptions to the manufacturing of transportation fuels, resulting in temporary shortages and price increases until the turnarounds are completed and the refineries are able to get back to full operational modes. The oil infrastructure has demonstrated a stellar ability to expeditiously recover and reconstitute critical services with minimum damage to public safety and health, the economy, and national security. All of petroleum production and manufacturing in California are also dependent on adequate water supplies.

## What you can do

1. Urge policymakers, regulators and community leaders to think broadly to find solutions across the entire energy system to meet California's ambitious environmental goals. This means renewables, electricity, and fossil fuels. Remind policymakers, regulators, residents and businesses that:
  - a. California is an isolated "energy Island" that currently imports more than half of the crude oil needed to meet the demands for boutique blends of transportation fuels manufactured in California for gasoline, diesel, and jet fuels.
  - b. Orange County receives 100% of its transportation fuel needs from three transportation fuel manufacturing centers on the West Coast: Pacific Northwest, San Francisco, and Los Angeles.
  - c. The availability of affordable, plentiful, reliable, scalable, accessible and dependable supplies of energy is what drives the economy of Orange County and California.
  - d. Orange County's 2.5 million vehicles are consuming about 3 million gallons of transportation fuels a day. While California's 100,000 electric vehicles are the most that any state has, the other 97% of California's 32 million vehicles that do not run on electricity or other alternative fuels are consuming more than 40 million gallons of transportation fuels, gasoline and diesel, every day, excluding jet fuel for the numerous airports.
  - e. Increasing fuel efficiencies of the mobile fleet are causing less tax revenue available to fund the transportation infrastructure.
  - f. Continued unimpeded access to marine terminals to maintain an adequate and growing import capacity for crude oil is essential to avoid potential constraints that can lead to possible fuel shortages and significantly higher prices for gasoline and diesel fuel.
  - g. The choice is with Californians to continue the ever increasing importation of crude oil from foreign countries into California ports, already at more than 50% of California needs, or to take advantage of the lower cost of crude oil from Canada and the Midwest which requires public approval of crude-by-rail projects to get that crude oil into California.
  - h. There needs to be a methodical and systematic move to renewable energy resources. We can begin by shifting to a more a balanced approach to our energy portfolio.

- i. Support local/statewide legislation for incentives for clean engine technology and clean energy refueling infrastructure.

### **Infrastructure Funding**

The cost to maintain the current grade of "B-" for Orange County Oil infrastructure as of 2016 is estimated at \$1 billion a year for the next 5 years for expenses borne by the in-state manufacturers, without government funding or a total private investment of \$5 billion, for refinery turnarounds (T/A's), planned and unplanned. The T/A's are privately funded and provide an essential opportunity for various T/A maintenance and repair issues, improvements, and modifications to implement technological enhancements.

***For any questions or clarification, or interest in a 20 minute PowerPoint presentation by me, for your employees or associates, please contact me:***

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