Union of Concerned Scientists

On the Path to Half the Oil

California's Leadership in Vehicles and Fuels Policy

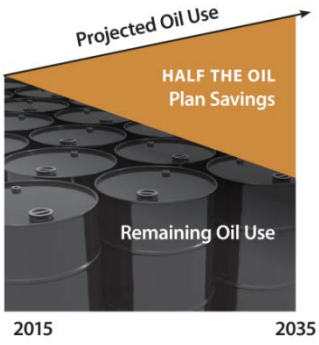
FACT SHEET

Through smart policies and support for innovative technology, we can lower our transportation system's global warming emissions and cut projected U.S. oil use in half over 20 years. Efficiency and innovation are the building blocks of this strategy, and California already leads the way in both. Although its residents use more transportation fuel—and spend more on it—than residents of any other state,[1] they are starting to have access to cleaner cars, better biofuels, more electric vehicles, and new transportation options. This progress points to a future in which Californians have more money in their pockets, good jobs, less pollution, and a more secure energy supply, and are seen as leaders on transportation technology.

These benefits will be due in large part to the complementary policies California has put in place over the past decade, including its Low Carbon Fuel Standard, advanced clean car standards, and "sustainable communities" strategy. By encouraging reductions in global warming emissions for every gallon of fuel used, helping ensure that less fuel is burned for each mile driven, and guiding the development of "smart" cities that allow people to drive less, these policies have combined to put California on a path toward lowering its heat-trapping carbon emissions to 1990 levels by 2020. To stay on this path, and meet its climate goals while cutting oil use, the state must not only maintain its innovative policies but strengthen them as well.

California's Low Carbon Fuel Standard

Oil and other petroleum products are the largest source of global warming pollution in the nation,[2] and transportation accounts for around 40 percent of California's carbon emissions.[3] Oil refineries in California emit 19 to 33 percent more carbon per barrel of oil refined than those in any other major U.S. refining region, primarily because California's mix of heavier and "dirtier" crude oils requires more complex processing.[4]



Learn more about UCS's plan to cut oil use in half at http://www.ucsusa.org/halftheoil

The state's Low Carbon Fuel Standard (LCFS) is therefore an important tool to help cut carbon emissions. By preventing existing fuels from getting dirtier and increasing California's use of cleaner alternative fuels, the LCFS will gradually reduce the "carbon intensity" of transportation fuels 10 percent by 2020. Each fuel's intensity is based on the total carbon emitted over its full life cycle, including production, transportation from point of origin to consumer, and tailpipe emissions.

The California Low Carbon Fuel Standard guides the market, driving a technology evolution toward cleaner fuels, including biofuels that minimize competition with food.

Because the LCFS uses a technology-neutral, performance-based approach, fuel producers can comply in many ways. One option is to either sell greater amounts of cleaner fuels or buy credits from others who do. Another option is to use innovative methods in the production process for existing fuels (for example, replacing natural gas with solar heat in the production of oil).

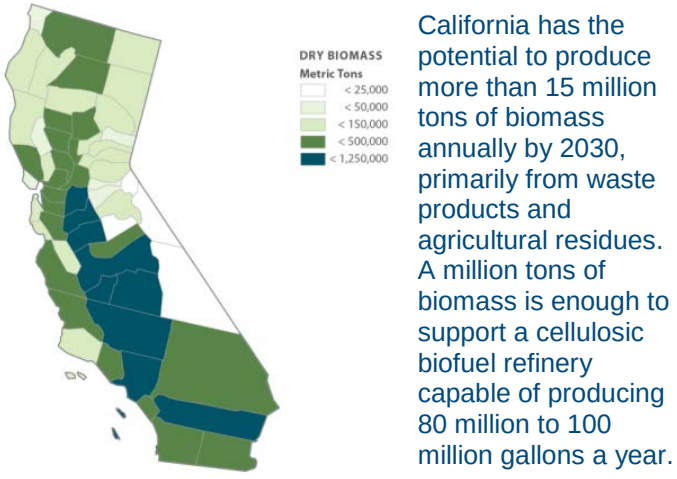
Market-based mechanisms allow fuel suppliers to choose the most cost-effective mix of fuels—including natural gas, electricity, and biofuels—that will meet the standard's requirements for reduced carbon intensity. Suppliers also have the flexibility to adopt innovative new technologies as they become widely available, including "cellulosic" biofuels made from environmentally friendly perennial grasses and certain waste products, and hydrogen produced from natural gas or renewable resources. The LCFS also provides incentives for oil companies to reduce pollution and enact best practices, both inside and outside California.

Cleaner fuels that minimize competition with food and forests

We can cut emissions and oil use by burning better fuels in our vehicles. The gas at our local stations already contains 10 percent corn ethanol on average—but corn ethanol is not the fuel of the future. Cellulosic biofuels would allow us to fuel up without putting added pressure on our food, water, and climate. California's LCFS—a policy developed in consultation with stakeholders and experts—can move biofuels in this direction while avoiding unintended consequences. By basing a fuel's carbon intensity on the full life-cycle emissions, including indirect emissions that reflect the impact of biofuel use on food markets and deforestation, the LCFS can drive a technology evolution toward cleaner fuels.

Federal biofuel policies, on the other hand, focus on volume and have resulted in a rapid increase in corn ethanol production and use over the last few years. Looking ahead, these federal mandates do require the growing use of other types of biofuels, including sugarcane ethanol from Brazil, biodiesel from vegetable oils, and cellulosic biofuels. Because the LCFS is focused on carbon intensity rather than volume, it is unlikely to expand the total volume of biofuel used in California; rather, it will move the state to choose the cleanest available sources today, and accelerate investment in even cleaner technologies going forward.

Figure 1. Biomass Resources in California



California has the potential to produce more than 15 million tons of biomass annually by 2030, primarily from waste products and agricultural residues. A million tons of biomass is enough to support a cellulosic biofuel refinery capable of producing 80 million to 100 million gallons a year.

Another advantage of focusing on life-cycle emissions is that it can help avoid deforestation. All food-based fuels risk deforestation because they accelerate the expansion of agriculture, but the LCFS accounts for emissions from land use, steering the market toward biofuels that minimize deforestation and use land efficiently—or don't use land at all (like fuel made from agricultural wastes including corn stalks).

Finally, the LCFS is tied to a regulatory review process that was revised in 2011. Continual technical review by land use change experts and agricultural economists ensures that the standard can be adjusted to avoid unintended consequences as the science evolves.

Clean Cars, Sustainable Communities

Low-carbon fuels are an essential part of the solution, but they are no silver bullet. That's why California has—and must maintain—a portfolio of policies to cut emissions and oil use.

Cleaner cars that use less oil

California's advanced clean car standards reduce air pollution and the adverse public health impacts of cars and trucks by relying on fuel-efficient and hybrid technologies and accelerating the market for battery-electric and fuel cell cars.

The state's global warming standards for cars and light trucks, for example, will not only cut new vehicle emissions 15 percent by 2016 and nearly in half by 2025 (compared with vehicles on the road today),[5,6] but also nearly double their fuel efficiency. These standards, which build on California's first-in-the-nation standards established in 2002, are part of a coordinated effort between California and federal agencies to establish a single, nationwide set of pollution and fuel efficiency requirements for automakers.

The state is also making sure consumers can choose the most advanced clean car technologies available; according to the California Air Resources Board (CARB), its Zero Emission Vehicle (ZEV) program requires battery, fuel cell, and plug-in hybrid electric vehicles to account for at least 15 percent of California's new vehicle sales by 2025. More than 20,000 plug-in vehicles were sold in California between 2011 and mid-2013, and the rate of sales is increasing;[7] in addition, several automakers are expected to take advantage of the hydrogen fueling infrastructure currently being built in California by unveiling fuel cell vehicles in 2015. As a result, state officials expect the ZEV program to drive more than a million electric vehicle sales between 2018 and 2025.

California has also taken steps to clean up larger vehicles such as heavy-duty trucks and tractor-trailers. The Heavy Duty Greenhouse Gas Reduction Regulation reduces global warming emissions and improves fuel efficiency through aerodynamic improvements and low-rolling-

resistance tires, potentially saving up to 750 million gallons of diesel from 2010 to 2020.[8] Just as the state is encouraging consumers to adopt advanced cars through purchase incentives, similar programs help fleet owners purchase hybrid and battery electric-powered medium- and heavy-duty trucks.

Reducing emissions through sustainable planning

Household transportation accounts for 30 percent of all global warming emissions in California, but through the implementation of the Sustainable Communities and Climate Protection Act of 2008 (SB 375), the state's regional planners have the means to reduce Californians' fuel use enough to cut transportation-related emissions by 30 percent or more.[9] Under the sustainable communities strategy laid out in SB 375, metropolitan planning organizations must examine the relationship between land use, transportation policies, and emissions reduction targets set by CARB, and integrate emissions-saving strategies in their development plans whenever feasible.

Wikimedia Commons: METRO96

Good planning on a regional and local basis can help place jobs, shops, and housing in locations that will minimize or eliminate private vehicle travel. Sustainable planning policies and practices can also reduce traffic accidents, clean up our air, revitalize local economies, and provide commuters with other options besides sitting in traffic alone in a car. By building neighborhoods that encourage walking, biking, and public transit, Californians can save both the time and money they would otherwise waste on commuting.[10]

The Solution to High Gas Prices: Use Less Oil

Together, these policies reduce the impact of all-too-common gasoline price spikes, which are driven by growing global demand, volatility in world crude oil prices, and both planned and unplanned refinery outages. A typical American driver will spend more than $22,000 on gas over the lifetime of a vehicle with average fuel efficiency (22.8 mpg) purchased in 2011.[11] But, if we use oil more efficiently, support better transportation options, and encourage greater investments in cleaner alternative fuels that diversify our fuel supply, we will dramatically reduce the amount of money we spend on oil.

For example, the advanced clean car standards in place from 2017 through 2025 will save Californians a total of $22 billion according to CARB. And individual consumers who buy a typical new car in 2025 will save $4,000 over the life of that vehicle compared with a 2016 vehicle, even after paying for clean car technology;[12] the added cost of these improvements would be fully recovered from fuel savings within the first three years of ownership. For used clean cars, the payback period can be shorter—even less than one year.[13]

Furthermore, many clean fuels are already less expensive than gasoline. Based on electricity rates in major California cities, UCS found that drivers using electricity as a fuel can save about $1,000 per year compared with an average new compact vehicle using gasoline at $3.50 per gallon.[14]

Less oil means a stronger economy and more jobs

California residents and businesses spent $59 billion at the pump in 2012, and the majority of this money left the state.[15,16] Since many cleaner fuel sources such as renewable electricity (produced from the wind and sun) and lower-carbon biofuels are already being produced or developed in the state, more money will stay in California as we shift to those resources.

Cleaning up our vehicles and fuels will also create new jobs. CARB estimates that in 2025 California's advanced clean car program would create 21,000 new jobs across the state as consumers spend less money on gasoline and shift that money to more productive parts of the economy.[17] A separate analysis indicates that expanded use of plug-in electric cars and trucks could create as many as *100,000* new jobs in California by 2030.[18]

California's leadership in clean car technology also benefits the nation as a whole. Federal global warming emissions and fuel efficiency standards that build on California's earlier efforts are expected to create 570,000 jobs throughout the U.S. economy, including 50,000 in light-duty vehicle manufacturing (parts and vehicle assembly), by 2030.[19]

Less oil and more diverse fuel sources increase energy security

The only way to truly reduce the risks posed by oil is to reduce the role of oil in our economy—that is the conclusion reached by a group of retired U.S. military leaders and executives of major corporations. As they explain, because oil and other petroleum products are traded in a world market, even an increased domestic supply will not insulate our nation from the influence of

rising global demand and political instability in oil-producing nations.[20] California's combination of transportation policies will improve the state's energy security by cutting oil use along with emissions.

Oil Companies Can Help or Hinder Solutions

Many industries in California and around the nation are stepping up to be part of the solution to climate change. Car companies have signed up to lower emissions and improve fuel efficiency. Utilities are also working to reduce emissions, as well as supporting more efficient use of electricity and accelerating the transition from fossil fuels to clean, renewable resources that will supply more than a third of the state's electricity by 2020.

Some in the oil industry, however, are fighting to weaken or dismantle California's climate laws and have even filed suit in federal court to block progress on clean cars.[21] It's time for these industry leaders to stop fighting innovation and efficiency, and instead become investors in the promising technologies that will enable us to slash our oil use and transition to cleaner fuels.

For its part, California must continue to lead the way in reducing pollution while showing the rest of the country the way to cut our projected oil use in half in 20 years.

For more information, please contact Jason Barbose at jbarbose@ucsusa.org.

This factsheet available online at ucsusa.org/ca_halftheoil

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