Testimony Before the United States House
Subcommittee on Energy and Power
Honorable Fred Whitfield, Chair
By Tom Tanton
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President T^2 and Associates
July 10, 2012

Thank you, Chairman Whitfield and members of the subcommittee for inviting me to testify today on California's nearly four-decade experience with alternative transportation fuels and vehicles. I intend this testimony to inform deliberation on "The American Energy Initiative." My comments reflect professional experiences over nearly four decades in California with programs to reduce petroleum fuels use in transportation. I attach a short bio for your convenience. I also attach excerpts from a paper published in 2006 that discusses various myths regarding petroleum, energy security and alternative fuels.

While my comments use the "Open Fuel Standard" (HR1687) for some initial points, the experience of California provides lessons more generally applicable to programs that attempt to mandate, encourage and subsidize alternative fuels and vehicles.

For example, the stated purpose of the "Open Fuel Standard" is "to ensure that new vehicles enable fuel competition so as to reduce the strategic importance of oil to the United States." It would require that each manufacturer's fleet be comprised of minimum levels of qualifying vehicles, defined as capable of using an alternative to petroleum fuels or multiple fuels (so called flex-fueled.) The requirements ramp up according to the following schedule:

- not less than 50 percent qualified vehicles beginning in model year 2014;
- not less than 80 percent qualified vehicles beginning in model year 2016; and
- not less than 95 percent qualified vehicles beginning in model year 2017 and each subsequent year.

California energy policy in transportation provides the Committee with a cautionary tale. California has had numerous programs similar in implementation (albeit often for air quality purposes, not strategic energy concerns.) In each case, they have failed due to lack of consumer acceptance of the "alternative" subsidized or mandated by the government. Based on my review of the provisions in HR 1687, and real world experiences in California the bill falls short in enabling:

- *Real competition.* In fact by mandating certain percentages, the bill stifles competition on a level playing field. There is nothing that precludes manufacturers, other than consumer resistance, from making available such vehicles for purchase absent a government mandate. Such vehicles are offered for sale by many manufacturers yet are not being bought in numbers by consumers.
- *Adequate time for markets to evolve*. Specifying time frames for market evolution will likely lead to market disruptions and rent seeking.
- *Flexibility to accommodate or account for future changes in the petroleum market.* For example, EIA predicts a 13% reduction in imports of petroleum by 2035, reducing the strategic

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importance of petroleum.[2] The Keystone pipeline would also significantly reduce the strategic importance of petroleum, depending on its ultimate construction and operation. Various vehicle types, such as electric vehicles, pose their own strategic concerns, such as Rare Earth metals needed for batteries and catalysts.

- *Informed consumers.* Consumers will face additional, unquantified, costs from purchase of qualified vehicles in addition to higher first costs, further compounded by conflicting policies. With respect to electric vehicles, for example, EPA's promulgation of revisions to Maximum Achievable Control Technologies (MACT) and various states' renewable portfolio standards increase the cost of electricity (necessary for recharging EV) by up to 40%, making the consumer's going forward cost to own an EV even more prohibitive and less competitive. Extension of the Production Tax Credit (for electricity from renewable sources) will further distance consumers from an electric vehicle market. Electric vehicles and hybrids are also more expensive to insure.

The bottom line is government efforts must acknowledge consumer perspectives, needs and opportunities, not try and overwhelm them. Unintended and unanticipated consequences make consumer resistance even worse by conflicting companion regulations and standards.[3] Finally, circumstances change and legislation must allow the flexibility to account for future knowledge and circumstances. I offer the following recommended principles to aid the Subcommittee in their deliberations.

1. Standards and Legislation should be technology neutral. It is best to not even refer to specific fuels in legislation, to accommodate technology, resource and market changes that will occur, but that are unforeseen,
2. Enabling true consumer choice should be paramount and recognize that consumers have very diverse—and expanding—needs and opportunities, and
3. Recognize that transportation is a critical infrastructure dependent on and depended upon by all other critical infrastructures…it is interconnected.

In other words, focus on free market mechanisms and consumer choice, principles and process rather than the technology or fuel of the moment.

Background

California is home to more than 37 million people and has the world's eighth largest economy, although it previously was number six. The population has grown from just under 24 million since 1980, an increase of almost 60 percent. Much of the growth in absolute numbers has occurred in large cities like Los Angeles, as would be expected, but less densely populated areas have grown much more rapidly in percentage terms. During this 26-year period, Los Angeles County increased by 50 percent, while Placer County, just east of Sacramento, more than doubled with a 173 percent increase. Other less populated counties are also growing rapidly.

[2] http://www.eia.gov/forecasts/aeo/chapter_executive_summary.cfm

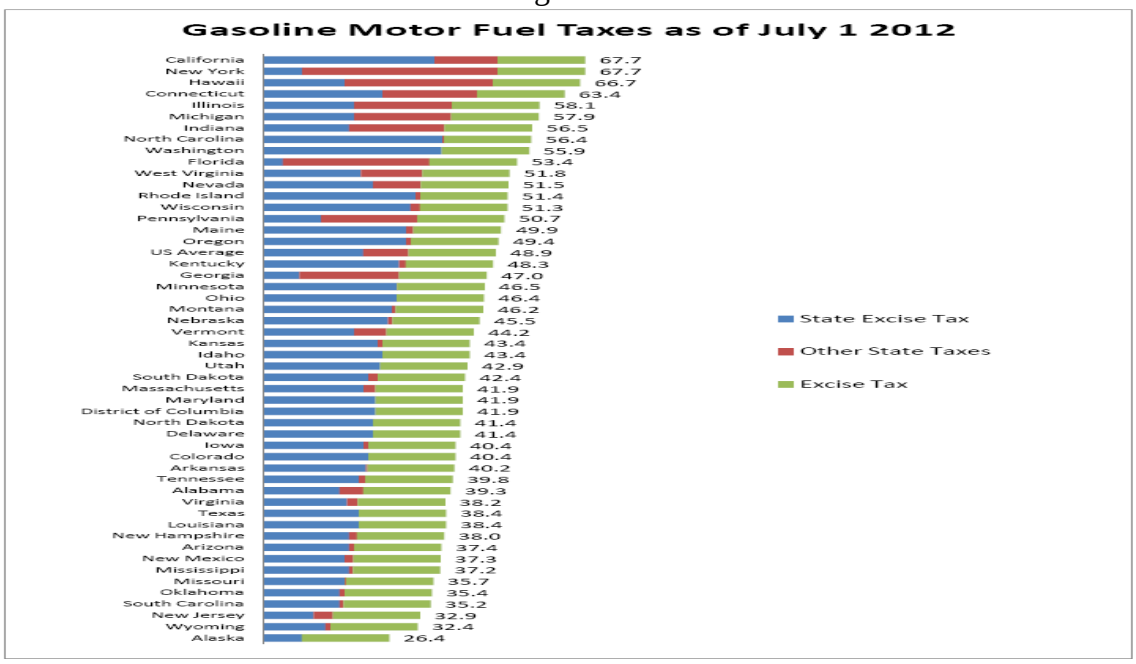
[3] For example, many air quality regulations limit fuel's "Reid Vapor Pressure" to control evaporative emissions, which have conflicted with specific alternative fuels' physical properties. Similarly, unintended consequences can perhaps best be illustrated by the need for specialized training for first responders to account for neat methanol's invisible flame.

In the 2000 U.S. Census, 15.7 million California residents aged five years and over reported changing their place of residence between 1995 and 2000. About an equal number of residents reported staying in the same house. Depending on their previous place of residence, the movers can be divided into four major groups: those who moved within the same county (62 percent), to a different county within California (20 percent), from a different state (9 percent), and from a different country (9 percent). Approximately 2.2 million Californians moved to other states, compared to 1.4 million who moved to California from other states and 1.4 million who moved to California from other countries[4].

The most recent published data from Bureau of Labor Statistics show that Nevada had the highest unemployment rate among the states at 11.6 percent while California was close behind at 10.8 percent, well ahead of the U.S. figure of 8.2 percent[5].

California consumers suffer with the nation's highest number of home foreclosures, as of May 2012[6]. California's economy as measured by gross state product (GSP) by the Bureau of Economic Analysis shows the recession has had a deeper and more prolonged affect on California, with losses of 4.7 percent in 2009 continuing to overwhelm modest gains of 1.7 and 2.0 for 2010 and '11. These compare with national loss in GDP of 3.8 for 2009 and gains of 3.1 and 1.5 percent for 2010 and '11. [7] These demographic changes have changed the commute and transportation patterns of Californians.

California has the nation's highest gasoline taxes as shown in Figure 1, from the American Petroleum Institute. It also has the fifth highest tax on diesel fuel.



[4] Source: Derived from California Department of Finance, Demographic Research Unit at http://www.dof.ca.gov/HTML/FS_DATA/LatestEconData/FS_Misc.htm, and U.S. Bureau of Economic Analysis at http://www.bea.gov/regional/index.htm#gsp

[5] http://www.bls.gov/news.release/laus.nr0.htm

[6] http://www.realtytrac.com/trendcenter/trend.html downloaded 7/5/2012

[7] http://www.bea.gov/newsreleases/regional/gdp_state/2012/xls/gsp0612.xls

California consumes 44 to 45 million gallons of gasoline and 10 million gallons of diesel fuel per day. The demand for transportation fuels increased nearly 50% in last 20 years. The number of refineries producing gasoline in California dropped from 32 in mid-1980s to 14 today. California imports 3.5+ million gallons of gasoline and components per day. Transportation fuel infrastructure is at capacity and not keeping up with rapidly growing population and demand. Future energy needs will be addressed through growing levels of imports. Local and regional congestion and air quality programs will influence future energy supplies. Permitting issues impact future energy supplies**,** including renewable fuels. Total gasoline, diesel, and jet fuel demand is forecast to grow by 13.5% to 42.8% by 2030, depending on economic vitality. By 2025, imports of crude oil into CA rise 37% to 65.2% (151 million to 266 million barrels per year) while transportation fuel imports increase by 199.7 million barrels per year by 2025 in high fuel demand case. Pipeline exports from CA to NV grow by 28.7 to 36.3 million barrels per year by 2025, an increase of 50.4% to 63.7%. Exports from CA to AZ increase by 29 million barrels per year (59 percent) by 2025.

Brief History of California Efforts to Encourage Alternatives

Since 1976, California has had numerous programs—incentives and mandates—to broaden the use of

- Methanol
- Ethanol (twice), including as an oxygenate replacement for MTBE
- Natural gas
- Electricity
- 'flexible fuel' vehicles, and
- Transportation Demand Reduction

As of 2009, California had just over 136,000 alternative fuel vehicles, out of 826,000 nationwide. The 136,000 represents less than one-half of one percent of the state's vehicles, even after 30 years of incentives, mandates and other programs. Programs were initially predicated on petroleum security, but more recently have focused on either air quality and/or greenhouse gas emissions. The mechanisms have changed little, other than becoming more complex.

Methanol: California led the search for petroleum fuel alternatives with initial interest focused on methanol. Ford Motor Company and other automakers responded to California's request for vehicles that run on methanol. In 1981, Ford delivered 40 dedicated neat methanol fuel (M100) *Escorts* to Los Angeles County, but only four refueling stations were installed. The biggest technical challenge in the development of alcohol vehicle technology was getting all of the fuel system materials compatible with the higher chemical reactivity of the methanol, and avoiding corrosion stemming from water absorption. Methanol was even more of a challenge than ethanol but some of the early experience gained with neat ethanol vehicle production in Brazil was transferred. The success of this small experimental fleet of M100s led California to request more of these vehicles, mainly for government fleets. However, longer-developing problems combined with high cost ultimately killed the program. At the time, almost all methanol was produced using natural gas as a feedstock, with an approximate 25% loss in energy content in the conversion from gas to methanol. Natural gas prices had increased and supplies decreased, leading to non-

competitive prices and short supplies. Ligno-cellulose based methanol (i.e. "wood alcohol") was only available in limited quantities as is true today.

Ethanol: The earliest ethanol program in California followed the initial methanol program, and began in the mid-1980s, but suffered from anemic consumer demand and little availability of ethanol fuel. The demand and supply for ethanol fuel (produced from corn) was stimulated by the discovery in the late 90s that methyl tertiary butyl ether (MTBE), a mandated oxygenate additive in gasoline, was contaminating groundwater. Due to the risks of widespread and costly litigation, and because MTBE use in gasoline was banned in almost 20 states by 2006, the substitution of MTBE opened a larger market for ethanol fuel. This demand shift for ethanol as an oxygenate additive took place at a time when oil prices were rising. By 2006, about 50 percent of the gasoline used contained ethanol at different proportions (generally about 5-10%), and ethanol production grew so fast that the US became the world's top ethanol producer, overtaking Brazil in 2005. This shift also contributed to a sharp increase in the price of corn-dependent foods including beef and dairy.

In 2008, Governor Schwarzenegger proposed and the California Air Resources Board is now implementing, a Low Carbon Fuel Standard (LCFS) to reduce the carbon content of transportation fuels by 10 percent[8]. Though purportedly a market-based mechanism, the LCFS is anything but, because consumers are not *willing* buyers of the mandated product. It is an alternative fuels plan.

Under the plan, transportation fuel sold in California would be subject to a ceiling on the amount of carbon it can emit per unit of energy. The limit takes into account the carbon produced throughout the fuel's entire life cycle, from production through consumption, albeit imperfectly.

One anticipated beneficiary of the new standard was ethanol, which has several major downsides:

- **Fuel will be less efficient.** Ethanol contains about 34 percent less energy per gallon than gasoline[9], which greatly reduces the number of miles traveled per gallon.
- **Fuel will be more expensive.** The reduced efficiency mentioned above increases the effective price per gallon. In addition, ethanol must be transported by truck or rail because it is too corrosive for pipelines[10]. These increased transportation costs contribute to higher prices at the pump.
- **Food will be more expensive.** Skyrocketing corn prices, driven by the clamor for ethanol, are squeezing California milk producers because of the increased cost of cattle feed, reported the California Farm Bureau[11]. In addition to increasing the costs of animal feed, the high price of corn has encouraged farmers to switch from other grains, such as wheat, to corn, thus raising the costs of other grains because of reduced supply.
- **Energy savings will be illusory.** When transportation, refining, and farming costs are factored into the production of ethanol for fuel, the energy savings is negligible. In fact, ethanol often requires more energy to produce than it yields.

[8] Executive Order S-01-07 by the Governor of the State of California, January 18, 2007.
[9] http://factsonenergy.com/?page_id=60
[10] http://www.api.org/aboutoilgas/sectors/pipeline/upload/pipelineethanolshipmentfinal.doc
[11] http://www.cfbf.com/news/FoodAndFarmNews.cfm?FFNID=822#1

The Boston Consulting Group (BCG) undertook an analysis of the Low Carbon Fuel Standard for the Western States Petroleum Association[12]. They found that implementation of the Low Carbon Fuel Standard will likely further reduce California's petroleum refining capacity by up to 30% (California is currently the third largest refiner of petroleum products[13]), lose 28-51,000 jobs, and result in a loss of tax revenue of more than $4 billion. This latter figure is about equal to 25% of the state's budget deficit.

Consumers have recognized ethanol's limitations. Ethanol has lower energy content than gasoline so the miles traveled per gallon is reduced. This increases the effective price per gallon, and increases the inconvenience of refueling. The more frequent refueling can add over twenty cents per gallon to the effective cost, to account for the additional refueling time. For a vehicle with an 18 gallon tank, that is filled up once every two weeks with gasoline, it would have to be refilled every nine days if using pure ethanol. Ethanol at $2.00 per gallon has the work capability of gasoline costing $3.03 per gallon. Mixtures of gasoline and ethanol (such as the 10% or 85% ethanol noted above) have intermediate mileage, vehicle range, and price affects.

Table 1 summarizes mileage and fill-up requirements for various mixtures of ethanol and gasoline, based upon the assumptions noted.

	100% Gasoline (base figures)	10% Ethanol	85% Ethanol
Mileage @ 26 mpg estimate	26 mpg	25 mpg	20.6 mpg
Range @ 18 gallon tank	468 miles	450 miles	372 miles
Range @ 13 gallon tank	338 miles	325 miles	269 miles

Consumers readily recognize this limitation and reflect that recognition in the preferential choice to purchase gasoline unless there is a large price differential.

Further, California does not have an adequate fuel supply infrastructure for bio-fuels such as ethanol, methanol or biodiesel and must rely on imports, typically from other countries. While bio-fuels may provide for some air quality benefit, they do little for energy security if demand expands greatly.

Electric Vehicles: California's Zero-Emission Vehicle mandate, first enacted in 1990, required that by 1998, 2% of the vehicles sold in the state by large automakers had to be zero-emission (i.e. electric) vehicles. That mandate was set to increase to 5% of vehicle sales by 2001, and 10% by 2003. But it was obvious that the technology to satisfy the ZEV mandate and consumer needs was not forthcoming. In 1996, the mandate was modified to allow automakers to sell more conventional (but "super-low-emitting") vehicles in order to get credit for meeting their ZEV mandate targets. In 2001, the mandate was further modified, to allow large automakers to satisfy their obligations if they sold just 2% "pure" zero-emission vehicles, 2% "advanced technology partial zero emission

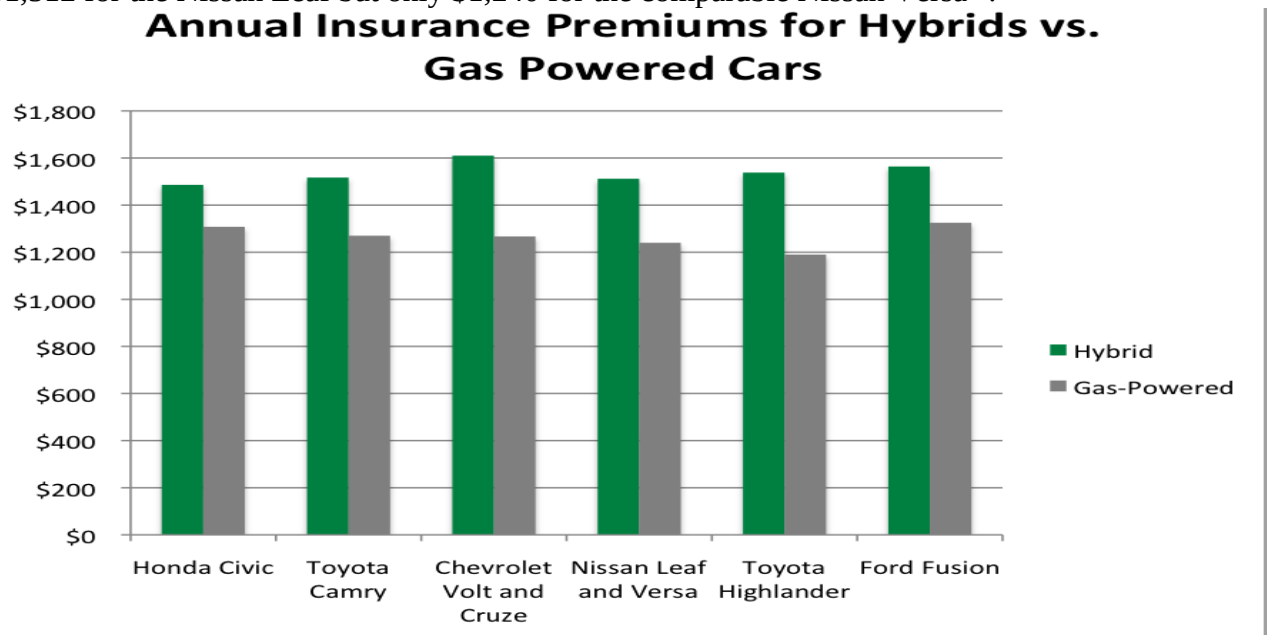
[12] *Understanding The Impact Of AB 32*; Boston Consulting Group for WSPA; 6/19/2012
[13] http://205.254.135.7/state/state-energy-profiles.cfm?sid=CA

vehicles PZEVs (aka, natural gas or hybrid-electric vehicles), and 6% conventional PZEVs, which are internal combustion vehicles that meet a "super ultra low emission vehicle standard."

Most recently, the ZEV mandate was further modified, and now mandates that "at least 15.4 percent of all cars sold by any major automaker doing business in California will have to be either fully electric, a plug-in hybrid or be powered by a hydrogen fuel cell by 2025."

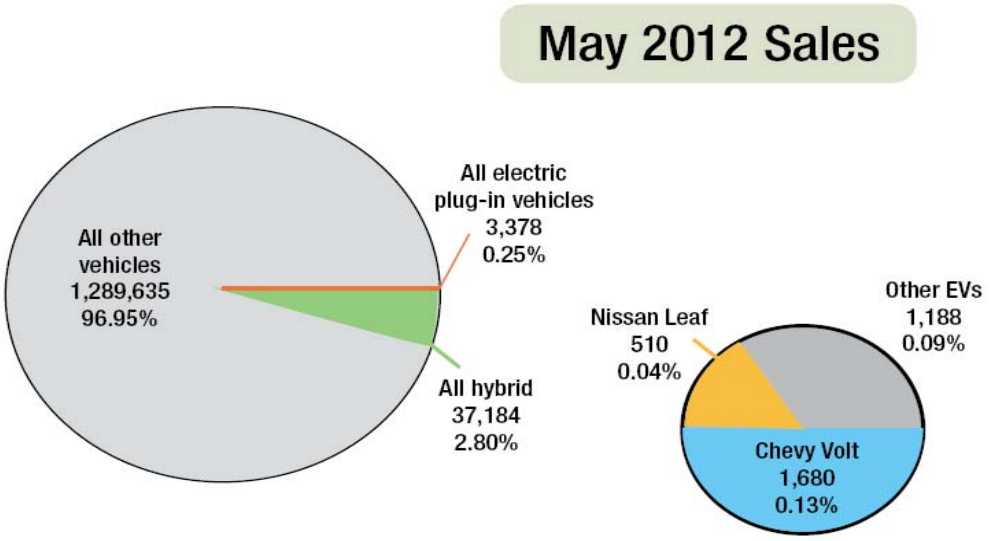
Electric-vehicle technology is still unable to satisfy the demands of consumers. The all-electric Nissan Leaf, with a limited range of about 73 miles per charge sells for about $35,000. Further compounding the initial cost is battery replacement, which can occur after about five years and represent 30 to 35% of the initial cost.

Electric hybrids are also more expensive to insure. Online insurance broker Insure.com shows that it costs $1,308 to insure a Honda Civic but $1,486 to insure a Honda Civic Hybrid. Similarly, it costs $1,270 to insure a Toyota Camry but $1,517 to insure a Toyota Camry Hybrid; $1,619 to insure a Chevrolet Volt but only $1,267 for the same-size gas-powered Chevrolet Cruze; and $1,512 for the Nissan Leaf but only $1,240 for the comparable Nissan Versa[14].



Consumer purchases reflect the higher costs. The figure below shows the volume of sales of the GM Volt and Nissan Leaf in perspective[15].

[14] California's EV Fetish; Kenneth P. Green; June 2012.
[15] Ibid.



Californians are likely to purchase fewer new cars and to continue driving their old cars longer, partly due to the continuing economic malaise. A recent CARB staff analysis suggests that the ZEV program will only very modestly reduce emissions (and petroleum use) from the vehicle fleet, not including likely slower fleet turnover. The emissions and petroleum use resulting from longer use of older cars will overwhelm the reductions from new ZEVs.

The ARB's Zero Emission Bus (ZEB) regulation was adopted in 2000 as part of the Transit Fleet Rule. It affects only large transit agencies with more than 200 buses and includes a 15 percent fleet ZEB purchase requirement. Two compliance paths are offered: the diesel path (2011-2026 time frame for purchase requirement) and the alternative fuel path (2012-2026 time frame for purchase requirement), which includes fuel cell buses and battery-operated buses.

Natural Gas Vehicles Compressed natural gas (CNG) and liquefied natural gas (LNG) vehicle and fueling infrastructure technologies are relatively well developed and there is negligible risk associated with technical feasibility. Natural gas vehicles (NGVs) have been proven to be commercially viable, albeit marginally in the U.S., where there are about 130,000 NGVs. Private companies are engaged in natural gas engine, vehicle, fueling station, and fuel supply businesses. In California, approximately 125 million gasoline gallons equivalent (gge) of CNG and LNG were consumed in 2006, and consumption has increased at an average rate of about 14% annually over the past five years. Two broad classes of NGVs are light-duty vehicles (LDVs, e.g., passenger cars, light trucks and vans) and heavy-duty vehicles (HDVs, e.g., transit and school buses, large trucks). The technologies, economics, and markets for these two NGV classes are significantly different. Natural gas is either compressed or liquefied and stored on vehicles as CNG or LNG, respectively. The vehicle and infrastructure technologies are quite different for CNG and LNG. Initially in California, safety concerns associated with compressed natural gas led to new standards for tankage and tankage placement.

In California, most natural gas transportation fuel is consumed by transit buses and garbage trucks. Both of these applications are partially driven by fleet rules (such as the CARB Transit Rule and SCAQMD Fleet Rules 1192 and 1193), and they also benefit from financial incentives (such as the

Carl Moyer Program, and Energy Policy Act, and Federal Highway Bill provisions). Other common heavy-duty natural gas applications include Class 8 tractor-trailer operations such as warehouse-to-retail distribution of grocery and other products.

As of 2006, there were about 5,000 natural gas transit buses operating in California. Roughly 90% of these were CNG fueled and 10% were LNG fueled. In addition to these buses operated by transit agencies, other natural gas buses of various sizes are operated as school buses, airport shuttle buses, and similar applications. The most recent count of natural gas garbage trucks indicates that, in 2005, there were approximately 1,300 natural gas garbage trucks in California.[16] Most of these (approximately 85%) were reported to be LNG fueled.

As recent as a decade ago, nearly all major domestic and foreign OEMs offered dedicated and/or bi-fuel CNG vehicles as part of their product line. All but Honda have dropped their NGVs from the U.S. market. Interestingly, almost all OEMs manufacture NGVs for non-U.S. markets. Consumers are not looking to buy light-duty natural gas vehicles.

Early California programs encouraged school bus operators, for example, to convert fleets to natural gas. School districts were paid subsidies to purchase new busses. However, the busses that were replaced (typically diesel fueled) were not retired, but sold to other school districts unable to participate in buying "new" busses. While these 'middle age' busses were more efficient compared to their same-size older busses, many school districts ended up with larger, and more fuel intensive, busses negating any net savings of emissions or petroleum.

Flexible Fuel Vehicles As an answer to the early lack of refueling infrastructure, Ford began development of a flexible-fuel vehicle in 1982, and between 1985 and 1992, 705 experimental FFVs were built and delivered to California and Canada, including the 1.6L Ford Escort, the 3.0L Taurus, and the 5.0L LTD Crown Victoria. These vehicles could operate on either gasoline or methanol with only one fuel system. Legislation was passed to encourage the US auto industry to begin production, which started in 1993 for the M85 FFVs at Ford. In 1996, a new FFV Ford Taurus was developed, with models fully capable of running on either methanol or ethanol blended with gasoline.

Today, the vast majority of alternative fuel vehicles, and a large percentage of all vehicles, are flexible fuel capable. Most consumers continue to preferentially fill with gasoline[17], even when given free choice.

Transportation Demand Reduction Transportation demand reduction programs have taken numerous approaches in California. Some require land use changes to drive higher density housing and co-location with employment, such as California's SB375. Some require higher vehicle mileage (such as CAFÉ) driven to the national level at California's insistence. Most recently, California committed $68 billion of borrowed money to build a high-speed rail system whose final cost is sure to escalate and whose ridership in uncertain at best.

[16] Cannon, J., "Greening Garbage Trucks: Trends in Alternative Fuel Use, 2002-2005," Inform, Inc. report, ISBN #0-918780-84-5, 2006.
[17] Here, blended gasoline is referred to, with the inclusion of ethanol as part of the RFS.

Even with long aggressive demand reduction programs, California remains second highest nationally in per capita consumption of petroleum.[18]

Conclusion

As of 2009, California had just over 136,000 alternative fuel vehicles, out of 826,000 nationwide. The state with perhaps the longest and most aggressive programs to encourage alternative fuels is not much further along than the rest of the nation. The 136,000 represents less than one-half of one percent of the state's vehicles, even after 30 years of incentives, mandates and other programs. Programs were initially predicated on petroleum security, but more recently have focused on either air quality and/or greenhouse gas emissions. The mechanisms have changed little, and remain mandates and subsidies. Neither has consumer demand changed appreciably, even with today's relatively high gasoline price. Consumer demand has not changed appreciably primarily because available alternatives are second best options, costly at best and with negative performance. Conflicting standards and regulations, such as recent Maximum Achievable Control Technology (MACT) revisions, state RPS and production tax credits, make certain alternatives even less attractive to consumers. Other interdependencies negatively affect the remaining alternatives. California's history illustrates that mandates and subsidies are not simple or even appropriate solutions to petroleum security.

[18] http://205.254.135.7/state/seds/hf.jsp?incfile=sep_sum/plain_html/rank_use_per_cap.html

Attachment 1

Thomas Tanton

Mr. Tanton is President of T^2 & Associates, a firm providing consulting services to the energy and technology industries. T^2 & Associates are active primarily in the area of renewable energy and interconnected infrastructures, analyzing and providing advice on their impacts on energy prices, environmental quality and regional economic development. Mr. Tanton is also Executive Director and Director of Science and Technology Assessment with American Tradition Institute. Mr. Tanton has 40 years direct and responsible experience in energy technology and legislative interface, having been central to many of the critical legislative changes that enable technology choice and economic development at the state and federal level. Mr. Tanton is a strong proponent of free market environmentalism and consumer choice, and frequently publishes and speaks against alarmist and reactionary policies and government failures.

As the General Manager at EPRI, from 2000 to 2003, Mr. Tanton was responsible for the overall management and direction of collaborative research and development programs in electric generation technologies, integrating technology, market infrastructure, and public policy. From 2003 through 2007, Mr. Tanton was Senior Fellow and Vice President of the Houston based Institute for Energy Research. Mr. Tanton was also a Senior Fellow in Energy Studies with the Pacific Research Institute until 2010.Until 2000, Mr. Tanton was the Principal Policy Advisor with the California Energy Commission (CEC) in Sacramento, California. He began his career there in 1976. He developed and implemented policies and legislation on energy issues of importance to California, and U.S. and International markets, including electric restructuring, gasoline and natural gas supply and pricing, energy facility siting and permitting, environmental issues, power plant siting, technology development, and transportation. Mr. Tanton completed the first assessment of environmental externalities used in regulatory settings. Mr. Tanton held primary responsibility for comparative economic analysis, environmental assessment of new technologies, and the evaluation of alternatives under state and federal environmental law. Mr. Tanton had oversight responsibilities for electricity and transportation technology development. Mr. Tanton served as Guest Lecturer for the Master in Environmental Science program at California State University Sacramento (CSUS), lecturing on power plant and electric grid technologies and their comparative environmental impacts.

Attachment 2
Excerpts from Proposition 87[19]: All Pain, No Gain

Tom Tanton & Amy Kaleita

Clean energy is an admirable goal. But a close analysis of Proposition 87 reveals that not only would there be minimal benefits to California's environment and energy picture, there would be a number of harmful effects.

Myth: We need alternatives to replace petroleum for energy security.

Reality: Energy security is an important goal. Energy security however, does not mean trading one set of risks for another. Heavy emphasis on reducing petroleum usage is as likely as not to create a less secure energy system for three simple reasons:

•Feedstocks for alternative fuels are weather dependent and subject to weather conditions. Much of the corn and other crops grown in the U.S. are grown with natural rainfall, and without irrigation. This subjects the crop supply to annual variability due to natural weather patterns. Further, devastating hurricanes and tornadoes have pummeled crops in several of the past few years. Moving our energy security to a system that includes crop-dependency on weather simply trades one form of insecurity for another. Energy security should come from shifting to a system of manageable risks, not the weather.

•Fuel will be competing with food demands for the major feedstock of alternative fuel production in the near to mid term. According to the US Department of Agriculture, farmers will need to plant 90 million acres of corn by 2010 in order to keep up with the already rising demand for ethanol fuel while maintaining current demands for livestock and exports. Speaking to the Senate Environment and Public Works Committee, the Agriculture Department's chief economist, Keith Collins, said the explosive growth in demand for corn for ethanol may have dangerous side effects. He said the thirst for ethanol may lead to high food prices and reduce soybean supplies. He also said land set aside for conservation may have to be utilized for ethanol production, estimating up to 7 million acres of land -- most in the Midwestern states -- now idled under the Conservation Reserve Program would need to be planted to grow corn and soybeans.

[19] Proposition 87, the "Clean Alternative Energy Act," on the statewide ballot in 2006 would have placed a tax on oil production in California, to fund a new bureaucracy charged with encouraging the development and adoption of alternative fuels. Voters resoundingly rejected the initiative.

•Energy ‘independence’ is not the same as energy security. Consumer activists expect independence to bring down the high price of gas and heating oil. Environmentalists hope it will promote "renewable" sources of energy. And global strategists think it will weaken anti-American oil-producing regimes.

But energy independence itself is not a desirable goal. It merely brings to the field of energy the stagnant isolationism of North Korea and the nationalistic mindset that destroyed the recent Doha round of world trade talks. What the U.S. needs is a greater reliance on free markets in energy, at home and abroad.

In America, "independence" has a positive sound because the country was born of an independence movement. But America's Founding Fathers were internationalists, not protectionists. Adam Smith's Wealth of Nations taught them that economic cooperation among nations is far more efficient than national isolation. Thus, the Founders would have seen that it is a good thing that one-third of all the energy consumed in the United States now comes from the international market, beginning with Canada. After all, when we buy from the world market, we buy the cheapest crude oil and petroleum products available from dozens of nations. We benefit by saving both our money and our resources; they benefit by obtaining dollars with which to buy our products and services, including food grown to feed their poor.

That is not to say foreign oil markets are without problems. They aren't. But those problems are not inherent in the commodity we call oil. They come from an inefficient and corrupt economic system: socialism. The nationalization of oil from Venezuela to Russia, and government activism in other forms, have diminished entrepreneurship, competition, and innovation in the energy field. As a result, demand has outpaced supply, and oil prices have risen in America and around the globe.

First, we should begin by shunning the punitive taxes that some want to slap on domestic oil companies. Higher taxes would raise prices at the pump. Over the long term, such taxes would deplete the capital needed to increase production.

Moreover, burdening California companies with more taxes will increase California dependence on oil from socialist regimes. National Oil Companies (NOCs) manage over 90% of the world's oil. And 16 of the 20 biggest oil firms (ranked by reserves) are government owned. According to The Economist, 'those with misgivings about oil--that its price is too high, that reserves are running out, that it damages the environment, that it is more a curse than an asset for countries that produce it"--

must focus on NOCs, and not so-called "Big Oil" companies like Exxon Mobil, Chevron, BP, and Royal Dutch Shell.

Myth: The government should choose those alternatives.

Reality: There are two realities that show that free markets are better at providing alternatives to the status quo. The first reality is the less-than-stellar performance of past government programs in developing 'clean, reliable, renewable' sources of energy. The state's renewable portfolio standard is mired in a regulatory morass, four years after enactment, with essentially zero new projects or production as a result. Another classic example was the dismal failure of the California Air Resources Board's *ZEV* program that initially mandated electric vehicles make up a certain percentage of all new vehicles in California. And, of course, the ill fated methanol program of the early 1990s that tried to "force fit a fuel" into a vibrant consumer oriented market spent millions of taxpayer dollars before being all-but-abandoned.

The second reality is that 35 plus million creative, innovative and incented Californians (plus their counterparts elsewhere) acting in virtual harmony will more likely create and develop efficient, effective and consumer friendly alternatives than 50 or 500 or 5000 government bureaucrats. The bureaucrats have no direct incentive to succeed, whilst the many do have an incentive to succeed—they can directly capture market share of the billions paid for energy every year. Further the many have direct knowledge of what it is they want to pay for—comfort, convenience, performance, efficiency, etc.

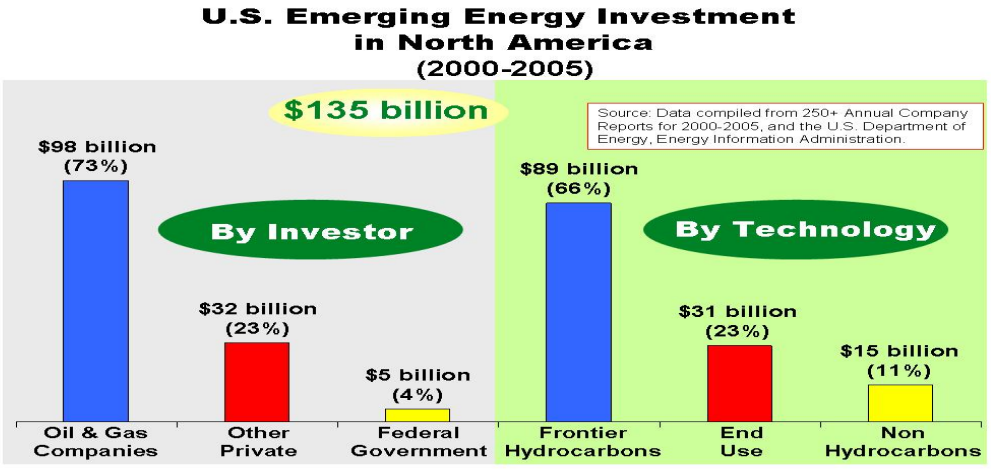
Myth: Oil companies are blocking access to cleaner, more reliable energy.

Reality: The reality is that oil companies, along with others, are leading the development of expanded supply types and sources of fuel. The energy challenge over the next several decades and beyond is to meet ever-growing demand with affordable, reliable supply, while ensuring environmental protection and quality. Recent years have witnessed historically high energy prices, a consequence of which has been a slate of new investments in alternative energy, frontier hydrocarbons and advanced end-use technologies that portend greater diversity of supply and environmentally friendly energy use in the future.

According to the Institute for Energy Research[20] (a non profit 501c3), U.S. oil and gas companies invested $98 billion from 2000 through 2005 on emerging energy technologies in the North American market[21] (***Figure 1***). This expenditure is 73% of the estimated total of $135 billion spent by U.S. companies and the Federal government.

In addition, the industry invested $11 billion (or 11% of the $98 billion total) for advanced end-use technologies, mostly for efficiency improvements through combined heat and power (cogeneration) and for advanced-technology vehicles using fuel-cell technology. Significantly, this $11 billion investment in end-use technologies represents 35% of the estimated total amount ($31 billion) spent by U.S. companies and the Federal government in this area.

Figure 1



In addition to the U.S. oil and gas industry, the motor-vehicle industry, agricultural industry, electric utilities, renewable-fuel industry, and the Federal government made other significant investments. These other private industries have invested $32 billion (or 23% of the $135 billion total) from 2000 to 2005. Of the $32 billion, $20 billion (62%) is associated with end-use technologies, $12 billion (37%) with non-hydrocarbons, and $0.3 billion (1%) with frontier hydrocarbons.

Myth: Oil companies are making too much money.

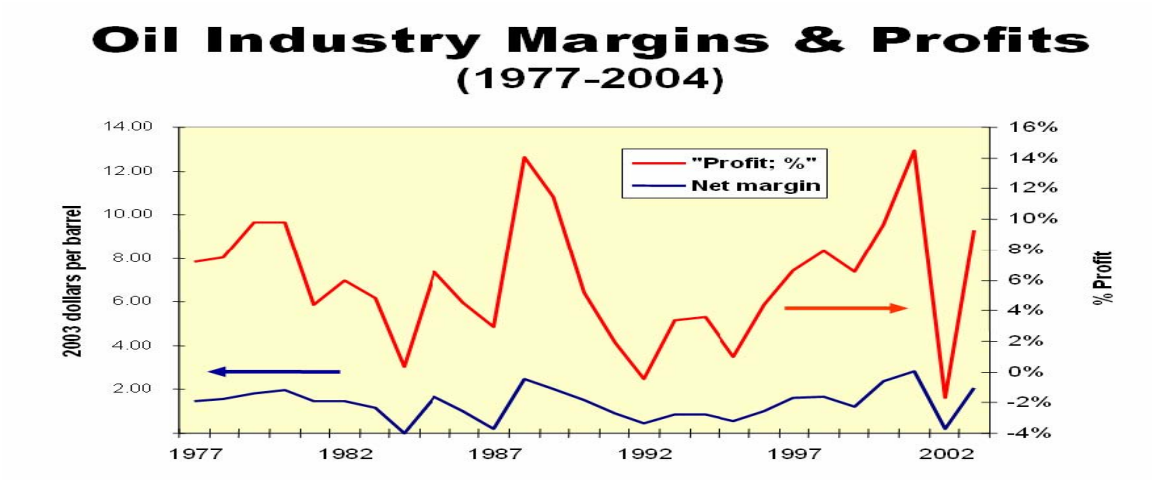
Reality: Petroleum production and refining experiences a business cycle, with both "good" years

[20] http://www.energyrealism.org/ier/studies/emerging/
[21] "North American market" is used herein to include Canada and the U.S.

and “bad” years. Capacity utilization and profit margins vary over time, as do profit margins. From 1985 to 2005, the average utilization factor for refineries increased from about 77% to more than 94%[22]. Utilization also varies month-to-month in response to the demands from summer driving and winter heating. Refinery utilization has been at or near peak capacity in recent years, lowering per-unit non-crude costs and increasing both overall resource efficiency and conversion. Similar fluctuations also are evident in other sectors of the well-to-use production cycle.

There are several ways to measure financial margins—gross operating margin per barrel processed, net margin, and profit margin. The volatility over the years suggests that focusing on profits in only one or two particular year is misleading. Figure 2 illustrates average financial margins for refineries from 1977 through 2004. Net margins should be viewed with the left Y-axis; profits with the right Y-axis. In a few years, profits were negative—i.e. companies lost money. Similar volatility is evident in other parts of the petroleum industry.

Figure 2[23]



Also, who is really making the money? A significant portion of oil company investors are average citizens, and those acting on behalf of individual investors and retirees. For example, the California Public Employee Retirement System (CalPERS) that provides retirement planning and investments for state and local public employees, holds several billions of dollars in oil company stocks, with over $655 million in Chevron and almost $2 billion in ExxonMobil, for the latest reporting period

[22] U.S. Department of Energy, Energy Information Administration
[23] Ibid.

ending June 2005.[24] Most individuals with mutual fund investments, 401k retirement plans or company administered retirement accounts, own oil company stocks.

[24] https://www.calpers.ca.gov/mss-pub/SearchController?viewpackage=action&PageId=SearchCatalog&package_code=797