

Critical Recommended Actions for Improved Statewide Transportation Energy Security, Greenhouse Gas Reductions, and Economic Growth by 2020

California Action Plan

FOR TRANSPORTATION ENERGY SECURITY



The California Secure Transportation Energy Partnership

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This Action Plan was independently researched and the assessment and analysis were independently performed by CALSTART staff on behalf of the California Secure Transportation Energy Partnership. Matt Peak served as the principal manager, investigator, and writer. Bill Van Amburg provided primary assistance and editorial review. Tom Brotherton provided key analysis and project support, as did Nate Glasow, Natalie Mims, and Kyle Datta at the Rocky Mountain Institute. Funding for this Action Plan was provided by the Hewett Foundation.

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The California Secure Transportation Energy Partnership (CalSTEP) is a diverse partnership of industry, automotive, business, academia, policy, and nongovernmental professionals working in their individual capacities to create a pro-business, comprehensive action plan that leads to significantly increased transportation energy efficiency and fuel choice in California.

CalSTEP believes that such action will expand the state's economy, enhance security, and reduce global warming emissions and other forms of pollution without compromising personal choice or backsliding on statewide air quality targets. It will also significantly improve productivity, geopolitical relations, and Californians' quality of life.

CalSTEP also believes that with an issue of this importance, waiting for federal action is not a option.

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CalSTEP Partners



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Summary

CALIFORNIA ACTION PLAN



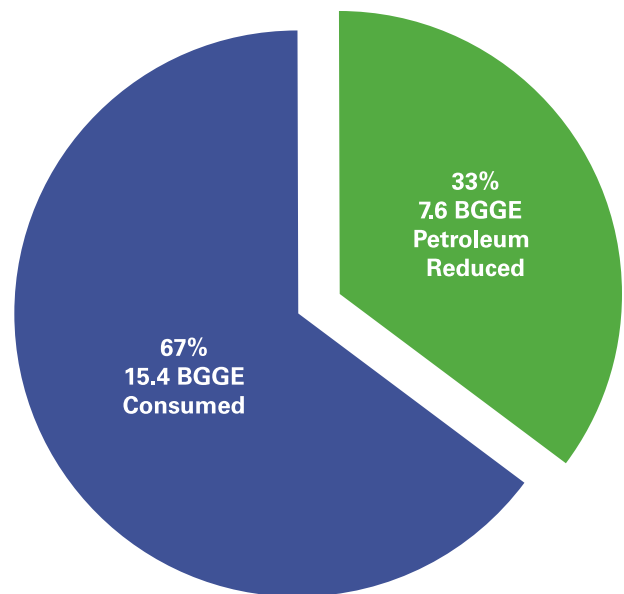


CalSTEP believes that it is critical to immediately reduce California's dependence on petroleum and increase its share of nonpetroleum fuel use. Such action will expand the state's economy, enhance security, protect California from severe energy supply and price shocks, and help meet California's transportation and greenhouse-gas (GHG) emissions goals without compromising personal choice.

For the past year and a half, CalSTEP partners and staff have worked in a collaborative process to identify, quantify, and select the most effective, politically viable, and economically beneficial actions the state can take to strengthen its transportation energy status. This resulting California Action Plan focuses on state-level measures that will achieve the following goal:

A sustainable reduction in the overall on-road petroleum fuel consumption in California to at least 15 percent below 2003 levels by 2020, while increasing the proportion of alternative transportation fuels in the state to at least 20 percent of total on-road transportation fuel demand.

CalSTEP's targets represent amounts that the state and governor, in part or as a whole, already have concluded are required for California to reduce the negative impacts associated with overdependence on imported oil. Since California used 18.1 billion gasoline gallon equivalents (BGGE)¹ of on-road gasoline and diesel in 2003, CalSTEP's target means deviating from a business-as-usual path on which the state would become more dependent on petroleum by consuming 23 BGGE in 2020,² and instead consume 15.4 BGGE.



The Goal - 7.6 BGGE Reduced in 2020
15.4 BGGE Consumed

¹ BGGE represents all fuels in energy-equivalent terms as a gallon of gasoline.
² 18.1 and 23 BGGE numbers obtained from: Kavalec, Chris, et al. Forecasts of California Transportation Energy Demand. California Energy Commission. CEC-600-2005-008. April 2005; p.9, Figure 3. (Assumes 1.1096 volumetric energy density ratio between diesel and gasoline.)



7.6 BGGE Petroleum Reduced

This Action Plan directs its attention to three distinct and complementary areas of action to supplement the 15.4 BGGE of petroleum consumed in 2020:

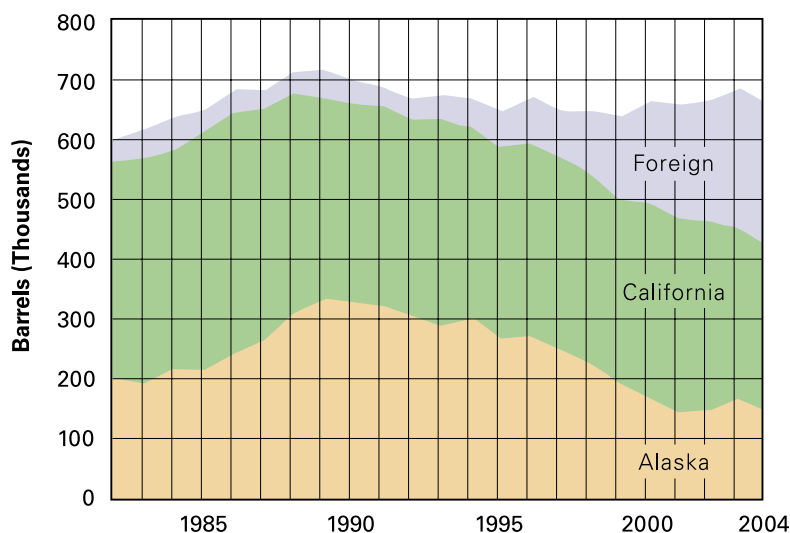
- Diversifying the state's fuel supply;
- Improving vehicular efficiency; and
- Reducing the need to drive.

CalSTEP chose to focus its attention on these three areas of action because they are complementary and provide a comprehensive look at the way Californians travel by road. These areas follow California's successful stationary energy strategy, allowing for the diversification of transportation energy sources and their efficient use while incorporating the more structurally related issue of reducing the need to drive. The Action Plan also recognizes that a major public education campaign is required to support the transition to a more energy efficient, secure, and prosperous society.

There are no silver bullets: No single action alone, or category of actions, is sufficient to achieve the results needed. But, if taken as a whole, the CalSTEP recommended actions will reduce statewide oil dependence by 7.6 BGGE and vehicular GHG emissions by 62 million tons each year, while leading to multiple and long-lasting economic and other benefits. This is a significant and meaningful outcome that is fully achievable through the actions CalSTEP outlines.

Why Reduced Oil Dependence Is Critical for and Beneficial to California

The United States' high consumption level, along with a steady and significant increase in demand from emerging economies such as China and India, is



Graph 1: California Petroleum Sources

Domestic sources decline as foreign imports increase.

Source: California Energy Commission

leading the world to consume ever greater amounts of oil. This problem could be significantly compounded if geologists' global "peak oil" predictions come true. Some speculate that the peak has already happened for the production of light, sweet crude oil, leading to problems such as increased price volatility. This volatility is also driven by the fact that, as indicated in **Graph 1**, California imports over 40 percent of its oil, which expands the state's trade deficit and weakens its economy.

The international race to discover and develop new oil fields that these factors prompt is leading to the increased support of unstable and undemocratic countries. It's also leading to the rapid development of nontraditional hydrocarbons, such as oil shale and sands. While this may appear to be a positive outcome, given that the United States and Canada have significant reserves of these nontraditional hydrocarbons, problems lie in their substantial production-related energy inputs and environmental impacts, including significant GHG emissions.

Even without the increased production of nontraditional hydrocarbons, excessive consumption of fossil fuels is the leading source (41 percent) of California's GHG emissions. If unchecked, California's growing oil demand will make it difficult for the state to meet its Assembly Bill (AB) 32 GHG goals,



thereby endangering its economy. Another potential source of economic risk comes from California's lack of spare petroleum refining capacity. It would require between \$8 billion and \$18.6 billion worth of refining capacity to meet all of the state's projected growth in transportation energy demand between 2003 and 2020 solely from petroleum sources.

After more than thirty years of ineffective national policies, dependence on imported oil has increased in the nation as a whole. Fortunately, in the absence of federal leadership, the state can take action. In fact, forty years of leadership and precedent indicates that California can not only succeed in securing its own transportation energy future, but can also reap multiple benefits by doing so and prompt the rest of the nation to follow its lead. By modeling action on the state's stationary energy policy, which teaches the virtues of energy diversity and efficiency, California can help or fully achieve its adopted transportation and AB 32 GHG goals and create a "California advantage" that buffers the state against the negative consequences associated with an excessive reliance on oil, while helping to grow the economy through the use of new technologies and fuels in which the state can be a worldwide leader.

Three Primary and Seven Supporting Actions to Achieve the Goal

CalSTEP supports actions in the three aforementioned distinct and complementary areas. The actions within these areas can be divided into:

Primary Actions	Supporting Actions
Primary actions are those that achieve the bulk of the petroleum and alternative fuels goals and are most urgent to adopt and implement.	Supporting actions complement and further enable the primary actions while leading to additional statewide economic, educational, and other benefits, but on their own may not achieve the stated goal.

Each of CalSTEP's primary and supporting actions helps to diversify California's fuel supply, increase its use of efficient vehicles, and reduce Californians' need to drive; each action also helps to make the state a better place to live.

CalSTEP has identified three high-priority actions that it urges the state to take immediately to begin moving toward a secure and prosperous transportation energy future:

Primary Actions

1	Codify Governor Arnold Schwarzenegger's fuel diversity goal by implementing a fuel-neutral, minimum-pooled Alternative Fuels Portfolio Standard of at least 10 percent by 2012 and at least 20 percent by 2020 that will increase the availability of and access to a diverse array of alternative refueling stations.
2	In support of the directives outlined in Governor Schwarzenegger's Executive Order S-17-06, which focuses on developing market-based solutions to global warming, implement an Energy Security Tax Relief and Realignment (ESTRR) program consisting of a Foreign Oil Security fee coupled with a tax rebate for all California taxpayers, which would use market mechanisms and price signals to significantly increase the efficient use of petroleum and help protect efficient-transportation capital investments.
3	Initiate a Smart Communities program that encourages energy-efficient and climate-friendly land-use policies and practices by providing new state transportation funding to local governments that will implement regional blueprints that reduce the need to drive.



Supporting Actions

Diversify the state's fuel supply	California Alternative Fuels Infrastructure Partnership
	California Renewable Fuel Production Initiative
Improve vehicular efficiency	State Fleet Leadership Challenge
	New Transportation Future and Revolving Loan programs
	Energy-Independent Vehicle Labeling Program
Reduce the need to drive	Neighborhood Planning Revolving Loan and Transit Use Assistance programs
	Usage-Based "Pay As You Drive" Insurance

The supporting actions that complement and further enable the primary actions while leading to additional statewide benefits can be broken down into the three CalSTEP distinct and complementary areas.

Primary Actions

Working through its deliberative process, in which progress was measured in economic, geopolitical, and environmental costs and benefits, CalSTEP identified three high-priority actions that it urges the state to take immediately to begin moving toward a secure and prosperous transportation energy future.

Alternative Fuels Portfolio Standard

California's dedicated alternative fuel infrastructure and use is limited, displacing approximately 53.5 million of the nearly 19 billion gallons of petroleum consumed in 2005.

Today, California motorists are forced to deal with what can only be described as a "monofuel" culture (**Graph 2, see page 6**). This isn't the case, however, in other states such as Minnesota or in nations such as Brazil and Sweden, where motorists have options when they pull up to the pump. With the implementation of thoughtful, well-crafted policies, California can also diversify its fuel supply and provide motor-

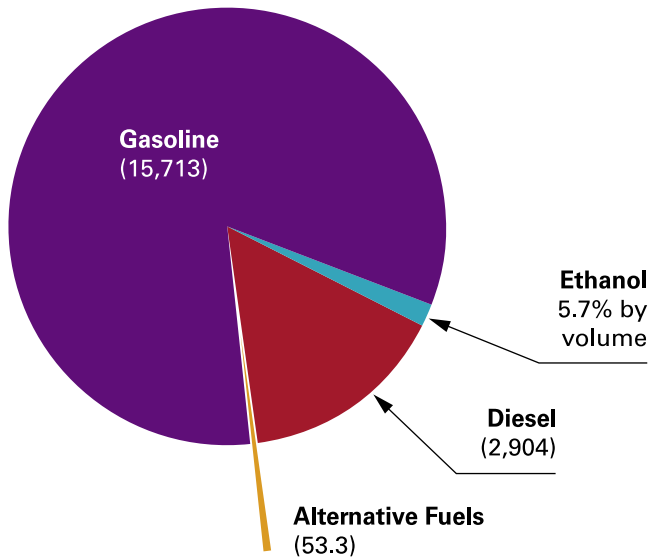
ists with nonpetroleum options when they refuel.

Accordingly, CalSTEP recommends the implementation of an Alternative Fuels Portfolio Standard (AFPS) that requires refiners to provide 10 and 20 percent of the state's transportation energy as alternative fuels by 2012 and 2020, respectively. An AFPS would establish a clear means by which the petroleum goals endorsed by two state agencies and the governor³ could be implemented and parallel the state's dynamic AB 32 Global Warming Solutions Act process.

The implementation of an AFPS would be modeled on the structure used to implement the more limited federal renewable fuels standards, which direct refiners to blend renewable fuels such as ethanol and biodiesel with petroleum fuels in order to reduce petroleum consumption and GHG emissions. CalSTEP believes that California should go beyond this directive and adopt a broader and more flexible AFPS that could include other nonpetroleum California Air Resources Board-approved alternative fuels and blends such as natural gas and propane. The AFPS, as opposed to the federal renewable fuels standards, is the approach of choice in Connecticut and Hawaii.

In addition to ensuring that the governor's previously outlined broad alternative fuel goals are met, an AFPS would give industry the flexibility to

³ In his response to the 2005 California Energy Commission Integrated Energy Policy Report, Governor Schwarzenegger asserted that the state should "adopt a goal of increasing the use of nonpetroleum fuels to 20 percent of on-road fuel consumption by 2020 and 30 percent by 2030 based on identified strategies that are achievable and cost-beneficial."



Graph 2: California's Petroleum and Alternative Fuels Demand—2005 (millions of gallons)

California's dedicated alternative fuel infrastructure and use is small, displacing approximately 53.5 million of the nearly 19 billion gallons of petroleum consumed in 2005.

Source: California Energy Commission

choose the most cost-effective and expedient solutions that meet the standard's requirements while potentially providing motorists with a greater level of choice when they pull up to the pump. Furthermore, an AFPS allows time for resolving air pollution uncertainties associated with low-blend biofuels (progress is currently being made), but enables the goal to be met regardless of whether these uncertainties are resolved.

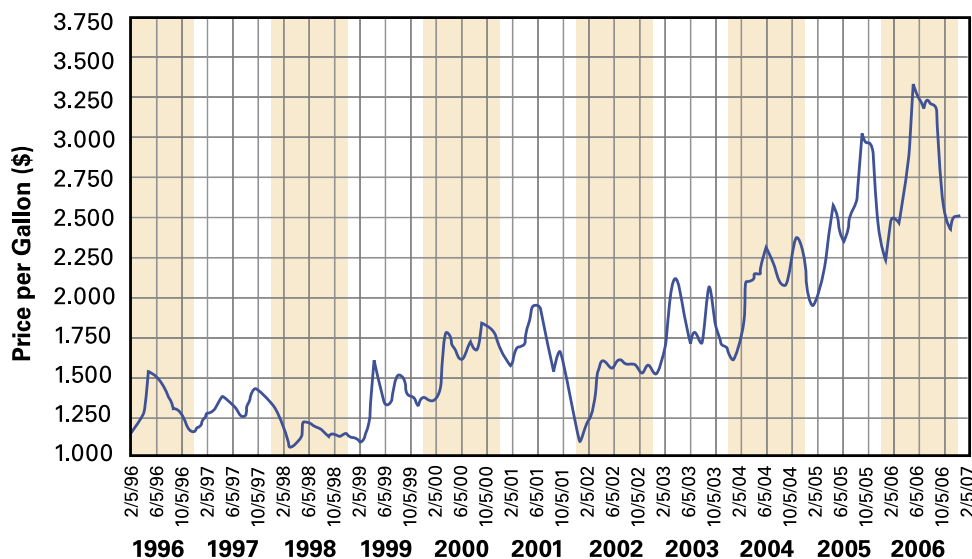
To facilitate the practicality of this requirement, the AFPS proposal would direct the California Energy Commission (CEC) to design and implement a credit trading program that allows obligated parties to comply with the AFPS standard through the purchase of tradable credits if they cannot or do not wish to blend or sell alternative fuels.

Market-based Energy Security Tax Relief and Realignment

CalSTEP believes that for significant progress to be made on fuel diversity and vehicular efficiency, Californians and the automobile industry need to have clear signals of the costs of fuel as well as access to markets that reward efficiency. Concurrently, California's governor and legislature will seek to develop market-based solutions to global warming to support the state's AB 32 Global Warming Solutions Act activities, as directed by Executive Order S-17-06.⁴ Accordingly, CalSTEP recommends that the state explore and implement an Energy Security Tax Relief and Realignment (ESTRR) program that would use market mechanisms and price signals to significantly increase the efficient use of petroleum and protect efficient-transportation capital investments while helping to satisfy both of the aforementioned goals.

Under ESTRR, the state would couple a revenue-neutral California Foreign Oil Security fee with a tax rebate or credits that would return all collected funds to all California taxpayers, who could use the money however they wish. The fee would be implemented if retail prices of petroleum fuels drop below an initial price floor of \$2 per gallon or the average price of fuel over the six months prior to implementation, whichever is greater, thereby stabilizing the price. This price floor would increase by \$0.01 per month for ten years to a maximum level of \$1.20 above the initial price floor, while each step of the way returning all collected funds to Californians. Alternatively, if it were easier to implement, the fee could be applied to barrels of oil at a level that stabilizes prices to refiners at an average of the price over the six months prior to implementation, and then raises it by 40 cents per barrel each month for ten years to approximate the per-gallon prices paid for petroleum fuels.

⁴ Among other things, S-17-06 calls for the creation of a Market Advisory Committee to make recommendations to the Air Resources Board on or before June 30, 2007, on the design of a market-based compliance program to support AB 32.



Graph 3: California Gasoline Prices 1996–2006

The rise and fall of gasoline prices in California creates an unpredictable investment environment for transportation capital.

Source: California Energy Commission

The Foreign Oil Security fee would provide stability to petroleum prices (see Graph 3) that has so often killed off investments in alternative fuels and efficient technologies. This price floor would also signal the long-term, steady increase in the cost of petroleum necessary for the automobile industry to justify investment in and speed the offering of more fuel-efficient vehicles, while protecting travelers by returning collected funds in the form of tax rebates or credits. The fee would not apply to alternative fuels, but motorists who use alternative fuels would receive the same tax rebates, thereby encouraging the use of such fuels. Altogether, CalSTEP believes this option would prompt automotive fuel efficiency gains across the board as well as spur the overall efficient use of fuel in existing vehicles, leading to annual savings of at least 2.9 BGGE and 29 million tons of GHG emissions in 2020⁵ while maintaining consumer choice and safety.

A growing chorus of bipartisan leaders and the public are rallying behind and voicing support for measures like ESTRR, including such luminaries as Alan Greenspan, N. Gregory Mankiw, and Andrew A. Samwick, among others. In fact, a Council on Foreign Relations independent task force chaired by John Deutch and

James R. Schlesinger mentioned a similar measure as a way to minimize the national security consequences of oil dependence. The public is looking for smart action on this issue, with as much as 59 percent in favor of an ESTRR-type measure to fight our oil dependence and increasing level of GHG emissions.

It is clear that significant progress on vehicular efficiency—progress that goes beyond the current national approach and that meaningfully assists the state in achieving its transportation energy and GHG goals—won't be achieved unless there is a significant increase in the introduction of efficient technologies in vehicles prompted by a decrease in some of these technologies' costs and greater public demand for efficient vehicles. For this reason, it is in California's interest to address these issues by adopting a market-based program like ESTRR to reduce petroleum use.

Smart Communities

Beyond vehicle technologies and fuels, it is essential that the state find ways to reward energy-efficient and climate-friendly land-use planning. California's current development patterns cause congestion and traffic that cost consumers and businesses approxi-

⁵ This number depends on how high the price floor is above normal retail petroleum fuel prices. This calculation assumes a price floor that is \$1.20/gallon above unadjusted retail price levels beginning in 2020 and a corresponding short-term petroleum demand elasticity of -0.25. A long-term petroleum demand elasticity of -0.6 indicates this measure would yield even greater petroleum and GHG reductions over time.



mately \$17 billion annually and result in more than 665 million gallons of wasted fuel per year. Unless significant changes are made in the way the state funds its transportation system, these problems will only increase as the state's population continues to grow.⁶

Accordingly, CalSTEP recommends that California establish a Smart Communities program that upgrades the state's transportation models so that the cost savings associated with energy-efficient and climate-friendly land-use planning can be fully realized. The recommended program takes a comprehensive approach that links new state infrastructure spending—such as that authorized in the recently passed Housing Bond and the Water Quality, Parks, and Conservation Bond—to the implementation of regional blueprints that will not only prevent sprawl, but will actively reduce the need to drive and cut the overall miles traveled by 10 percent over approximately twenty-five years.

A primary means of accomplishing this goal could be the greater use of smart growth, defined as a set of characteristics associated with well-designed transportation systems and land use that allows people to live closer to where they work and provides convenient transit options. Many communities, such as San Francisco, Atlanta, Portland, and Maryland, have already adopted smart growth strategies to significantly reduce the need to drive. Various reports cite the potential smart growth has to reduce the need to drive and save motorists fuel and other costs, which could add up to \$10 billion a year or more. The flexibility of the Smart Communities program would allow additional options that have demonstrated significant vehicle miles traveled (VMT) reductions to also be implemented to meet regional targets.

In all cases, funding priority under Smart Communities would be based on criteria including the expected level of VMT reduction. The state could even issue grades to regions and municipalities based on their VMT reduction plans, ranking those regions whose blueprints demonstrate the greatest level of VMT reduction highest. The program would be

administered by the Department of Business, Transportation, and Housing, the California Transportation Commission, and local councils of governments.

Supporting Actions

Each of these supporting actions complements and further enables the progress that can be made through the primary actions while leading to additional statewide economic, educational, and other benefits and reducing statewide petroleum consumption even if they are pursued independently.

California Alternative Fuels Infrastructure Partnership

CalSTEP recommends a California Alternative Fuels Infrastructure Partnership between the state government, automobile manufacturers, and fuel retailers that provides incentives for the concurrent rollout of alternative refueling stations and alternative fuel-capable vehicles.

This program would make state-sponsored financial support for a California Air Resources Board-approved dedicated alternative refueling infrastructure contingent upon vehicle population growth, thereby ensuring that alternative fuel vehicles (AFVs) won't be introduced without infrastructure development, and that the state won't waste money supporting infrastructure for nonexistent vehicles. This approach spreads the responsibility for alternative fuel development among the state, automakers, and fuel retailers, but recognizes and mitigates the financial risk that retailers take on.

The program would provide a state grant averaging \$50,000 for a specific alternative fuel's infrastructure development whenever 6,000 vehicles, on average, that can run on the fuel are sold in the state, with a cap in total funding of \$9 million per year over ten years. The goal is to match a sufficient quantity of alternative fuel stations with vehicles by 2020 to make a tangible difference in petroleum and GHG reduction and help establish a business case that encourages fuel retailers to continue adopting

⁶ California's population is predicted to grow nearly 40 percent by 2025.



alternative fuels even after the subsidies run out. Incentives for early station adoption and vehicle production are provided by front-loading the program.

If fully exercised, this program would help promote the creation of 1,800 alternative fueling stations and 11 million alternative fuel-capable vehicles, totaling approximately 20 percent of the transportation refueling infrastructure and approximately 33 percent of the state's light-duty vehicle fleet by 2020.

California Renewable Fuel Production Initiative

CalSTEP recommends a California Renewable Fuel Production Initiative that overcomes barriers to in-state conventional and advanced renewable fuel production and feedstock use, thereby promoting industry growth and economic prosperity as the state increases its renewable fuel consumption.

Under this program, the state would create (and the CEC would administer in coordination with the Department of Food and Agriculture and Integrated Waste Management Board) \$20 million worth of competitive research and outreach grants over five years focused on high-priority areas and objectives that overcome the key barriers to sustainable production of renewable transportation fuels from crops and waste sources in California.

This program also would direct the state to mirror a program initiated by New York Governor George Pataki that jump-starts advanced renewable fuel production from in-state resources by providing up to \$20 million to as many as four applicants or teams of applicants that successfully demonstrate the technical, financial, business, and organizational capability to construct a pilot-scale or first-production scale enzymatic-hydrolysis, gasification lignocellulose-to-ethanol, or biomass-to-liquid facility that utilizes in-state plants and materials. Recipients must use the information derived from their facilities' operation to develop commercial-scale production facilities.

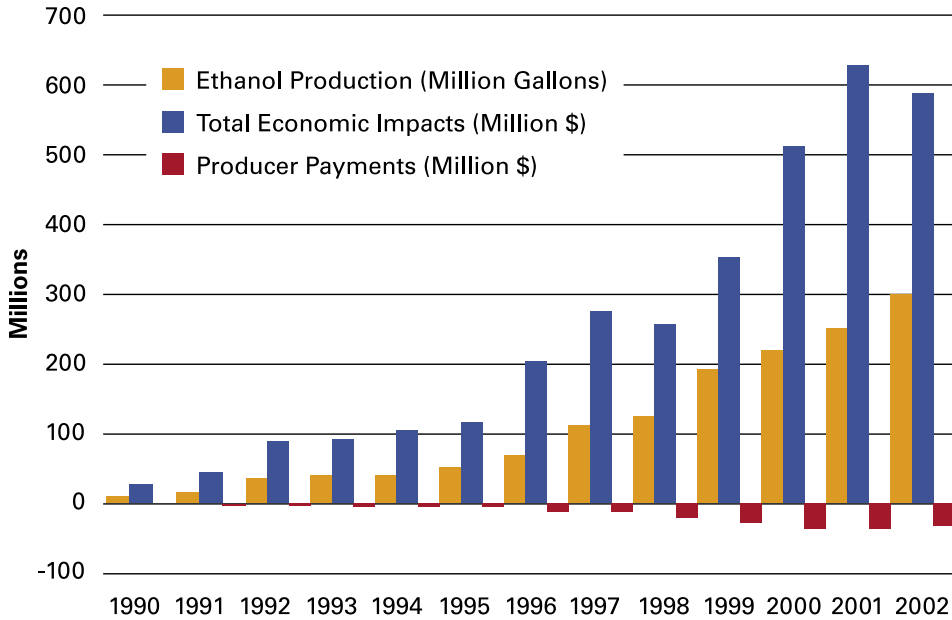
Such a California-based program would harness the state's ability to overcome first-mover risks asso-

ciated with early advanced renewable fuel production from in-state feedstocks and solve early production problems and logistics, both of which are necessary before investors can be expected to commit large-scale capital. While not directly responsible for reductions in petroleum use or GHG emissions, the California Renewable Fuel Production Initiative would complement and augment CalSTEP's other alternative and renewable fuel-related programs. A future action incorporated into this program could be financial incentives for use of in-state feedstocks from underutilized land or waste resources. Incentives could be production tax credits or even abatement for biofuel growers or biorefinery operators on the proportion of the fuel they produce from these preferred feedstocks.

California can expect significant economic benefits from helping to develop an in-state renewable fuels industry.

The state that took the most aggressive action to develop its own renewable fuels, Minnesota, today receives a sixteen- to twenty-fold return on investment for its ethanol program (see **Graph 4 on page 10**).⁷ Its drive to greater use of renewable fuels led or is leading to the creation of dozens of plants that produce over 600 million gallons each year, as much as \$1 billion in output, as many as 5,000 jobs, and over \$1.3 billion in net annual benefit to the state. California can follow this same path: A CEC report states that, at 2005 consumption levels, a California ethanol industry alone would create approximately 8,000 jobs and provide statewide economic benefits of \$5 billion over a twenty-year period.

⁷ For every \$1 paid for ethanol producer incentive payments, the state receives \$16 to \$20 in economic impact.



Graph 4: Minnesota Ethanol Production, Producer Payments, and Economic Impacts

As of 2001, Minnesota not only had met its ethanol needs, but also had become a net exporter of the fuel.

Source: Minnesota Department of Agriculture

State Fleet Leadership Challenge

CalSTEP recommends that the state issue a State Fleet Leadership Challenge whereby the state would live up to the spirit of the federal Energy Policy Act, use its formidable buying power to expand market size, and lead others to reduce petroleum consumption by 20 percent by 2020 by setting an example with the state fleet.

Based on a similar challenge issued by North Carolina, this program prescribes a goal—not the methods for achieving the goal. The advantage of such a structure is that a variety of methods can be utilized. The state can meet the target by fuel swapping, blending renewable fuels with petroleum fuels, adopting AFVs, phasing in more fuel-efficient vehicles, or some other innovative method. The state has ample opportunity to reduce its petroleum consumption, given the fact that of California's over 5,200 alternative fuel-capable vehicles in the 2002 state fleet, only 63 (1.2 percent) were fueled with alternative fuels, leaving the remaining 98.8 percent to be fueled with conventional gasoline.

By taking a leadership role, state fleets are not only using their formidable purchasing powers to expand markets, but are actively engaged in the search for creative and cost-effective techniques for reducing petroleum consumption.

If North Carolina can employ these methods and set a goal for 2010, surely California can adopt the goal of 20 percent petroleum-use reduction by 2020.

This program can extend itself by serving as a beacon and a challenge to county and municipal fleets, many of which purchase vehicles based on a state specification, and eventually to private fleets, including those doing business with the state.

New Transportation Future and Revolving Loan Programs

CalSTEP recommends an increase in state-level investment in vehicle technologies that can reduce vehicular petroleum consumption and GHG emissions while making the air cleaner. California must serve as a leader and encourage industry innovation, which such investment would demonstrate. Specifically, CalSTEP recommends the creation of:

- A \$140-million-per-year New Transportation Future program that provides competitive grants and/or creates inducement prize competitions focused on facilitating the commercialization of advanced, low-GHG transportation technologies and fuels that reduce oil consumption and overall emissions in light-, medium-, and heavy-duty vehicles, while also providing assistance for these technologies' adoption.
- A \$25 million low-interest revolving loan or loan guarantee fund to reduce heavy-duty vehicle (Classes 3–8) petroleum consumption and GHG emissions.

This program recognizes that there is a shortfall of public investment in advanced transportation technologies and that continued leadership is needed for all types of vehicles, including light, medium, and heavy duty, to overcome risks and speed development. It creates a New Transportation Future program that would invest \$70 million per year in competitive grants for research, development, and demonstration of these technologies. By ranking grant applications based on the level of petroleum and GHG and other emissions reduced per dollar invested, these competitive grants would replicate the success of the current Carl Moyer program (which has become famous for its cost-effective reduction of criteria pollutant emissions), in the area of petroleum and GHG reduction and on a broader scale by applying it to light-, medium-, and heavy-duty vehicles. If the track record of the Moyer program is a guide, a similar program focused on transportation energy and GHG emissions would provide cost-effective petroleum and GHG reductions while utilizing technologies capable of rapid deployment.

A portion of the funds allocated under this program could be used to initiate a series of high-profile inducement prize competitions and/or a series of smaller targeted competitions that identify criteria for meeting goals and targets (including product characteristics and sales requirements) and then reward winners that achieve the goals with a cash prize and/or advanced market commitments. This

model could be used to overcome numerous large and small barriers to reducing petroleum consumption and spurring alternative fuel use in California. Benefits could include:

- The creation and deployment of efficient transportation technologies and vehicles;
- The production and sale of various alternative fuels or fuel-related technologies;
- The creation and deployment of mass transportation technologies and platforms;
- The demonstrated reduction of various communities' need to drive;
- Positive national media exposure; and
- Increased private investment in California companies.

Inducement prize competitions have a long track record of spurring innovation. For example, the 1927 Orteig Prize prompted Charles Lindbergh's solo flight across the Atlantic Ocean and revolutionized modern aviation; the 2004 Ansari X PRIZE revolutionized personal space flight; and NASA's Centennial Challenges will provide a total of \$250 million to generate innovative solutions to space technology problems. Inducement prize competitions also regularly demonstrate superior cost-effectiveness, leveraging as much as a 50:1 private/public investment ratio.

Whether a competitive Moyer-like grant or an inducement prize competition is employed, the prime contractors or recipients of the investments allocated under the New Transportation Future program would be California companies, universities, and/or nongovernmental organizations and their partners.

The New Transportation Future program would provide \$70 million per year for incentives to adopt climate-friendly transportation technologies, such as dramatically more fuel-efficient vehicles, technologies spurred by the inducement prize competitions, and incentives to build alternative refueling stations (as described in the California Alternative Fuels Infrastructure Partnership). The funding could include incentives similar to those offered by the





Environmental Protection Agency's (EPA) Smart-WaySM program to reduce heavy-duty vehicle fuel consumption and GHG emissions.

Because heavy-duty vehicle operators can receive a direct financial payback by adopting efficiency-enhancing technologies, CalSTEP recommends the creation of a \$25 million revolving low-interest loan program to complement the New Transportation Future program and assist with the further adoption of these technologies. Under this program, any heavy-duty vehicle owner or operator, including fleets and independent operators, would be eligible to apply for funding. Such a program could be particularly helpful to independent truck operators, who usually purchase new trucks from fleets once the trucks are about five years old and then drive them for another twenty years or so.

Energy Independent Vehicle Labeling Program

CalSTEP recommends the creation of a voluntary vehicular labeling program that quickly and clearly informs shoppers about new low-petroleum/GHG vehicles at dealerships, thereby educating people about, increasing the demand for, and prompting manufacturers to produce more of these types of vehicles. This label would provide quick and easy identification of those vehicles that meet established efficiency and GHG-reduction goals.

Repeatedly, "green" labeling has effectively curbed the purchase and use of products that are associated with various social issues or encouraged the purchase

and consumption of those products that are more socially desirable. Some notable examples include the "dolphin safe" tuna label, the EPA's Energy Star[®] label, and the Forest Stewardship Council's seal of approval. The Energy-Independent Vehicle Labeling program would parallel these efforts by creating a single qualifying label with two grades: A Platinum label, which focuses on a vehicle's absolute GHG emissions and oil consumption, and a Gold label, which focuses on a vehicle's relative emissions and consumption by footprint size. This dual-grade labeling approach encourages people to drive the most energy-independent vehicles on the road, or encourages them to select the most energy-independent vehicles that meet their needs.

It's important to note that the program establishes a standard that increases over time. Every vehicle could achieve this standard; there is no limit on the number, as long as vehicles meet the pre-established goal for each model year.

The success of this program largely depends on the design and differentiation of the logos, plus consumers' knowledge of their existence and subsequent understanding of their meaning. To begin addressing these issues, the state would hold a design competition for the labels as part of the program's initial launch and publicity campaign. Such a competition has precedent in California: In 2002, the state challenged its residents to come up with a design for the state quarter. Over 8,000 people submitted designs (see **Picture 1**) within three months, from which



Picture 1: State Quarter Design Competition Submissions

Within three months, the state quarter design competition generated over 8,000 submissions, from which a winner was selected. CalSTEP believes a vehicular labeling design competition could achieve even better results.

Source: <http://www.quarterdesigns.com/proposed/californ.html>



a twenty-member commission selected the ultimate winner. A vehicular labeling design competition could achieve even better results by generating awareness of the problems of GHG emissions and oil dependence, enthusiasm for addressing them, superior out-of-the-box designs, publicity, and a grass-roots source for the designs' origination.

Automakers would have the option of whether to affix labels to their vehicles that are recognized under the program, but would most likely do so in order to associate their vehicles with the superior performance standards of the program and the labels' growing prestige.

Neighborhood Planning Revolving Loan and Transit Use Assistance Program

Like other CalSTEP programs, the Smart Communities program is inherently flexible. The focus of the program is VMT reduction, but it allows regions to determine their preferred method. The program also seeks to provide multiple tools to achieve the outlined goals. Accordingly, CalSTEP proposes a Neighborhood Planning Revolving Loan program, to be administered by the Department of Housing and Community Development, which will assist with the preparation and implementation of regional blueprints that meet the Smart Communities program goal of reducing driving by 10 percent.

The state's creation of a revolving loan fund that is replenished by the fees developers would have paid for project-level environmental impact reviews (EIRs) provides communities with the resources for programmatic rather than parcel-only planning, but without costing developers more money or time. Such planning would help account for the ways in which properties and neighborhoods interact, adjust for driving increases, and streamline the process by which developers can obtain approval to implement smart growth development.

By developing overall plans for blocks of properties in advance, communities can streamline the development process while maintaining neighborhood goals. Developers would pay back the costs of the planning as part of their existing fees for devel-

oping properties within the blocks.

At a funding level of \$20 million per year for five years, the state would help overcome the largest barrier to community planning on a programmatic level and, at its fully funded level, enable more than thirty concurrent programmatic EIRs, thereby significantly assisting with smart growth development.

Finally, because of the significant petroleum and GHG reduction potential of public transportation, CalSTEP also proposes that the state examine and offer incentives that spark greater use of public transit, and take steps in this area to further align state spending with the goal of reducing the need to drive. Such incentives and alignment actions could include tax incentives for employer-sponsored transit commute programs, the establishment of privately funded amenities to public transit development projects, the construction of thoroughfares designed for multiple transportation modes, and the location of state-funded buildings close to public transit.

Usage-Based "Pay As You Drive" Insurance

Typical automotive insurance rates are fixed, often poorly reflect how many real-world miles a motorist drives, and fail to provide incentives for motorists to reduce their amount of driving. Usage-based automotive insurance, however, recognizes actual miles driven and reduces premiums for motorists who drive fewer miles than their plans allow. This type of insurance is also known as "pay-as-you-drive," and it can be a powerful incentive to reduce driving by providing a financial reward to motorists who do so.

Various regions are taking steps to enable usage-based automotive insurance. Cities such as Philadelphia; states such as Oregon, Massachusetts, and Minnesota; and countries such as the United Kingdom realize the benefits of usage-based insurance. These benefits include providing incentives to reduce VMT due to savings of \$50 to \$100 or more on motorists' insurance premiums as well as a 12- to 15-percent reduction in vehicle crashes.

CalSTEP recommends modifying the California Code of Regulations to permit insurance providers



to implement voluntary programs and technologies that more accurately track vehicular mileage, and to provide these insurers with the authority to offer discounts based on the adoption of such programs, the reporting of miles traveled, and the reduction of VMT. Such action would allow companies that are currently offering usage-based auto insurance policies, such as Progressive Insurance and GMAC Insurance, to offer such policies in California. It would also, through competition, encourage other automotive insurers to develop and implement usage-based policies, thereby allowing participating drivers to keep more money in their pockets should they decide to drive less.

While petroleum will remain an important component of California transportation fuels into the future, using it more efficiently, increasing the availability of alternatives, and reducing the overall need to drive will buffer the state from dependence on unpredictable and unstable foreign sources of energy, expand its economic opportunities, and improve Californians' quality of life.

In the future, after insurance providers' and motorists' responses to these modifications to the California Code of Regulations can be gauged, the state could explore providing incentives to entice insurance companies to offer consumers a choice between time-based and mile-based premiums.

Net Outcome: A Stronger Economy through Reduced Oil Dependence and Higher Efficiency

Taking these actions requires leadership and a long-term vision for the state. Yet the benefits are tangible, significant, and long lasting.

While petroleum will remain an important component of California transportation fuels into the future, using it more efficiently, increasing the availability of alternatives, and reducing the overall need to drive will buffer the state from dependence on unpredictable and unstable foreign sources of energy, expand its economic opportunities, and improve Californians' quality of life.

The individual pursuit of each of these components can seem daunting. However, comprehensively addressing them rather than implementing a piecemeal vision will have a positive impact on the system in which they operate and maximize the benefits to the state.

Such a comprehensive approach takes the shape of market-based mechanisms that reward efficiency and diversity as well as investments that benefit the state's industry and consumers while meeting the overall goals. By committing itself to this longer-term approach, California can create a different atmosphere in 2020 than the one it faces today, and create a model that other states and the nation can follow.

Rather than supply constraints, price volatility, and petroleum dependence, California can instead create diversity of choice and greater economic growth, and it can demonstrate the benefits of efficiency and clean fuels for both greater security and a sustainable environment.

Table of Outcomes and Benefits

Recommended Actions	Outcomes in 2020	Annual BGGE Petroleum Reduction	GHG (Millions of Tons/Year) Reduction
Primary Actions	15% less petroleum consumed (from 2003 levels); 20% of all transportation fuel in California is from alternatives	76	62
Alternative Fuels Portfolio Standard	20% of all transportation fuel in California is from alternatives	2.9	15
Market-based petroleum reduction through ESTRR	Petroleum fuels are used more efficiently due to an increasingly fuel-efficient vehicle population and incentives to use existing vehicles more efficiently	2.9	29
Smart Communities	VMT reduced by 10%	1.8	18

Supporting Actions (within Categories)			
Diversify the state's fuel supply	California Alternative Fuels Infrastructure Partnership	20% of all transportation fuel in California is from alternatives	1 BGGE on its own
	California Renewable Fuel Production Initiative		Goal enabler, economic growth driver
Improve vehicular efficiency	State Fleet Leadership Challenge	Petroleum fuels are used more efficiently due to an increasingly fuel-efficient vehicle population and incentives to use existing vehicles more efficiently	Enabler; education tool
	New Transportation Future and Revolving Loan programs		0.3 on its own
	Energy-Independent Vehicle Labeling program		Enabler; education tool
Reduce the need to drive	Neighborhood Planning Revolving Loan and Transit Use Assistance program	VMT reduced by 10%	1.8*
	Usage-based "pay as you drive" insurance		18*

*These actions support the overall reduction





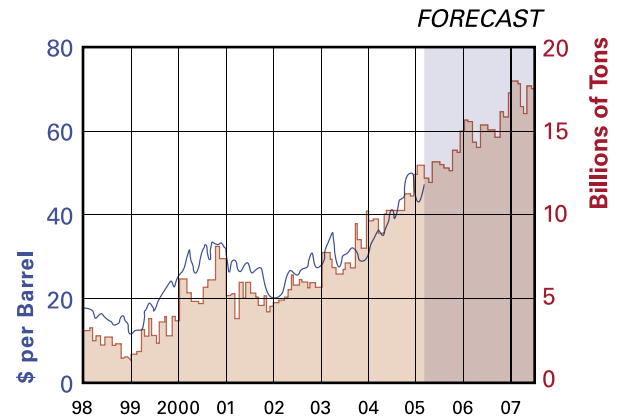
California Can Secure Its Transportation Energy Future

Increasing competition for global oil, a strained economy and increasing trade deficit, limited refining capacity, and growing dependence on imported oil that strengthens undesirable regimes around the world all lead to an urgent need for action to secure California's transportation energy future.

Transportation energy security is a goal and responsibility that is typically thought of as one that should be pursued by the federal government. However, with these associated problems, and a national dependence on foreign oil that has climbed from 40 to 60 percent since President Richard Nixon's 1973 Project Independence was announced,⁸ this goal and responsibility is falling on other shoulders. In the absence of federal leadership, California has stepped up to define the parameters of such a goal; and it has forty years of precedent to indicate that not only will pursuing this goal be successful, but also that it can lead the rest of the nation to follow its path.

The CEC and Governor Schwarzenegger have already established the urgent need and feasible targets for petroleum reduction to protect the state from energy supply and price risks. Yet there are other reasons for and benefits to reducing petroleum consumption. By significantly increasing its transportation energy efficiency and diversifying its transportation fuel sources, California would support or fully achieve its adopted transportation energy security and AB 32 GHG goals, follow precedent established by its successful stationary energy programs, create a "California advantage" to buffer the state against the negative consequences associated with an excessive reliance on oil, and help grow the economy through new technologies and fuels in which the state can be a worldwide leader.

The Current Transportation Energy Outlook: A Need for Action



Increased Chinese Demand Helps Drive Up Worldwide Oil Prices

Source: UBS, reprinted in *The Economist*

The world is consuming ever-greater quantities of oil. Thanks to the United States' high and increasing consumption as well as a steady and significant increase in demand from emerging economies such as China and India, overall demand for transportation energy over the next twenty years is expected to increase by more than 50 percent.⁹ California is a part of this problem: In 2004 California drivers paid \$35 billion to travel 330 billion miles and consumed 18.1 billion gallons of fuel.¹⁰ Over the long term, this increase in demand from California and elsewhere, will inflate the price of oil, which will weaken California's economy.

This problem could be significantly compounded if geologists' global "peak oil" predictions come true. A recent report supported by the U.S. Department of Energy states that peak oil production, which is the singular event indicating the halfway point of the entire planet's oil production, could come within five years, and almost certainly will come by 2020; after that, production will inexorably decline.¹¹ This report warns that the world should be spending \$1 trillion each year to develop alternative energy sources and avoid peak oil's associated

⁸ Energy Information Administration

⁹ Annual Energy Outlook 2005. Energy Information Administration. DOE/EIA-0383(2005) February 2005.

¹⁰ Navai, Reza. State's Perspective on Land Use, Transportation, Energy/Greenhouse Gas Emissions Connection. Presentation delivered to the CEC IEPR Workshop, September 22, 2006. [Online] http://energy.ca.gov/2007_energypolicy/documents/2006-09-22_workshop/presentations/Navai.pdf

¹¹ Hirsch, Robert L., et al. Peaking of World Oil Production: Impacts, Mitigation, and Risk Management. February 2005. And Hirsch, Robert L., et al. Economic Impacts of Liquid Fuel Mitigation Options. National Energy Technology Laboratory. Department of Energy. May 2006.



crippling economic effects and resulting chaos.¹² Some speculate that the production of light, sweet crude oil, the type most favored by oil refiners, may have already peaked and now must be replaced by more expensive and harder-to-extract sources. The results of this prognosis include uncertain and tight levels of worldwide petroleum supplies and further price volatility.

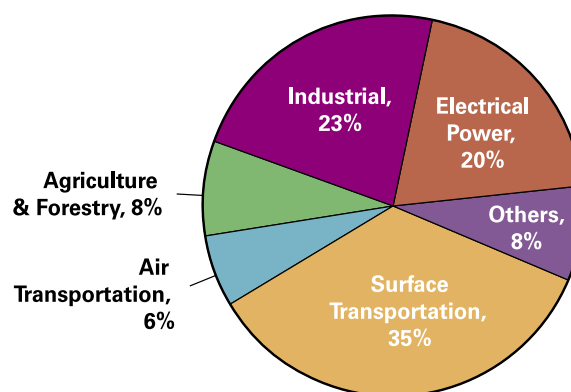
Excessive consumption, peak oil, and high and volatile prices are prompting an international race to discover and develop new oil fields. California already imports over 40 percent of its oil,¹³ which sends a significant portion of its money overseas, expands the state's trade deficit, weakens its economy, and often helps support regimes such as those in Saudi Arabia, Venezuela, Russia, and Iran¹⁴ that are either politically unstable, hostile to the United States, undemocratic, or a combination of the above.

Furthermore, nations that aren't bound by human rights considerations, such as China, are dealing with and investing in unstable and undemocratic countries, such as Sudan. Because of the globalized nature of the oil industry, such a trend to utilize oil from unstable and undemocratic countries magnifies the United States' and California's vulnerability, geopolitical positioning issues, and support of questionable regimes. In fact, an independent task force established by the U.S. Council on Foreign Relations recently came to the stark conclusion that "the lack of sustained attention to energy issues is undercutting U.S. foreign policy and national security."¹⁵

Another result of this race to discover and develop new oil fields is the rapid development of nontraditional hydrocarbons, such as oil shale and sands. At first glance this may appear to be a positive result, given that the United States has the world's largest reserves of oil shale and Canada has

close to the world's largest reserves of oil sands.¹⁶ Transportation energy from these sources therefore reduces the flow of money to geopolitically undesirable and unstable parts of the world. However, there are real problems with obtaining energy from these nontraditional hydrocarbons. Because these fuels come in the form of semisolid mixtures of bitumen, clay, sand, and water, or in the form of rocks rich in organic material, tremendous amounts of energy and resources are required to process them and yield petroleum. It takes about 1,200 cubic feet of natural gas and two to four barrels of water to produce one barrel of synthetic oil from two tons of oil sand.¹⁷ Furthermore, the extraction of these fuels through surface mining can leave permanent scars on landscapes and vegetation.

Oil shale and sands production is also a significant source of GHG emissions. A recent report from Canada's Office of the Auditor General stated that oil sand operations' contribution to annual



Graph 5: California's 2002 Total CO₂ Emissions from Fossil Fuel Consumption (360 million metric tons)

Source: California Department of Transportation

¹² Ibid.

¹³ CEC. [Online] http://www.energy.ca.gov/gasoline/gasoline_q-and-a.html

¹⁴ According to the Central Intelligence Agency's The World Factbook, Saudi Arabia, Venezuela, Russia, and Iran together have approximately 40 percent of the world's proven oil reserves.

¹⁵ National Security Consequences of U.S. Oil Dependency. Council on Foreign Relations. October 12, 2006: p. 9.

¹⁶ The United States has 3.3 trillion tons of oil shale deposits, and Canada has between 1.7 and 2.5 trillion barrels of oil reserves in the form of tar sands.

¹⁷ Canadian National Energy Board. Canada's Oil Sands: Opportunities and Challenges to 2015: An Update June 2006. [Online] http://www.neb-one.gc.ca/en-energy/EnergyReports/EMAOilSandsOpportunitiesChallenges2015_2006/EMAOilSandsOpportunities2015QA2006_e.htm. And Government of Alberta. Department of Energy. What is Oil Sands? [Online] <http://www.energy.gov.ab.ca/100.asp>



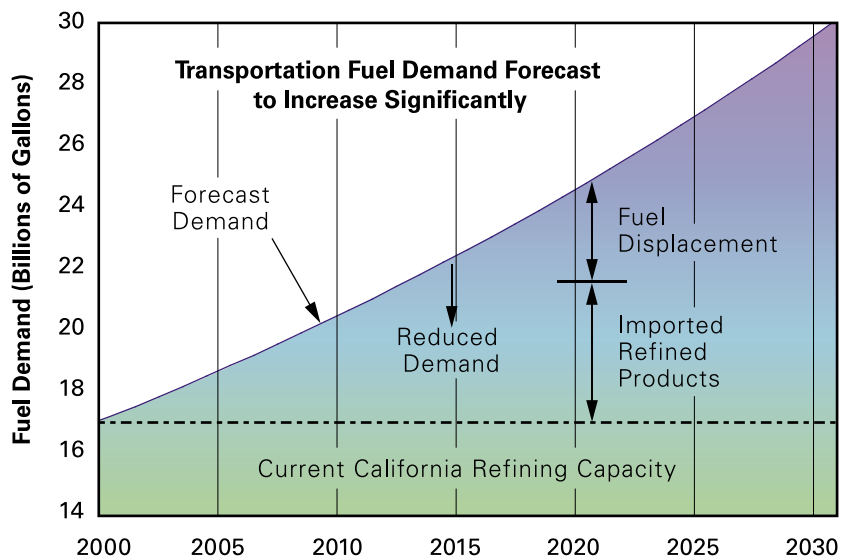
GHG emissions could double between 2004 and 2015.¹⁸ And even without the increased production of synthetic oil from oil shale and sands, excessive consumption of fossil fuels is the leading source of GHG emissions. In California, transportation fueled almost entirely by petroleum fossil fuels is responsible for approximately 41 percent of the state’s overall GHG emissions, as indicated in **Graph 5 (page 17)**.¹⁹

If current growth trends continue, gasoline use and related CO₂ emissions in the state will increase approximately 40 percent over the next twenty years.²⁰ Under a business-as-usual scenario, the global warming effects will particularly affect Californians’ way of life. Global warming is expected to have adverse impacts upon the state’s water supplies, the Sierra snowpack, and agriculture and food production. In addition, it is expected to cause significant increases in pestilence outbreaks, a projected doubling of catastrophic wildfires, and damage to the state’s extensive coastline and ocean ecosystems.²¹ If no major actions are taken to reduce GHGs, the state can also expect higher food, water, energy, insurance, and public health costs. In addition, global warming is expected to create significant environmental damage to the state and could result in the loss of many species.²²

California’s newly enacted AB 32 process calls for significantly reduced GHG emissions from

all sectors. A secure transportation energy future can make significant contributions to this process by decreasing transportation’s share of GHG emissions. This effort can help protect the economy: The recently released Stern Review report, *The Economics of Climate Change*, commissioned by the British Government, estimates that while the cost of GHG stabilization could be 1 percent of global gross domestic product (GDP) by 2050, the dangers of inaction could be equivalent to 20 percent of global GDP or more.²³

Excessive consumption, peak oil, high and volatile fuel prices, and GHG emissions are all sources of actual or potential economic destabilization in California. Yet another contributing factor is the demand for finished product (i.e., gasoline and diesel fuel), the production of which requires oil refinement. California’s lack of spare refining capacity and the gap



Graph 6: California’s Refining Capacity Is Maxed Out, Gasoline Imports Make Up for Supply Shortages

Source: California Energy Commission

¹⁸ 2006 Report of the Commissioner of the Environment and Sustainable Development. Office of the Auditor General of Canada. September 28, 2006: Chapter 3, p. 19.
¹⁹ CEC. Inventory of California Greenhouse Gas Emissions and Sinks: 1990–2004. Publication # CEC-600-2006-013. 2004.
²⁰ Navai, Reza. State’s Perspective on Land Use, Transportation, Energy/Greenhouse Gas Emissions Connection. California Department of Transportation. Presentation delivered to the CEC IEPR Workshop, September 22, 2006. [Online] http://energy.ca.gov/2007_energypolicy/documents/2006-09-22_workshop/presentations/Navai.pdf
²¹ California Air Resources Board.
²² Ibid.
²³ Stern, Sir Nicholas. *The Economics of Climate Change. The Stern Review.* Cabinet Office – HM Treasury, United Kingdom. October 2006.



between California's refining capacity and demand (see Graph 6), which will expand considerably over the coming decades, adds another degree of insecurity to this market. This situation is currently remedied by the importation of refined products.²⁴ However, should a California refiner or an out-of-state supplier experience difficulties and be taken offline, California's economy could suffer significantly. Tankers would have to ship gasoline from the half-dozen refiners around the world that can produce the state's clean-burning gasoline, a process that takes seven to ten days at a minimum.²⁵ Graph 6 illustrates that, under a business-as-usual scenario where no action is taken to reduce California's oil consumption, this problem is poised to grow worse over time.

Under business as usual, the oil industry would need to devote between \$8 billion and \$18.6 billion worth of petroleum infrastructure to meet the state's additional transportation fuel demand solely from petroleum sources.

The state's limited refining capacity also illustrates that the business-as-usual pathway does not imply little or no additional costs. Under business as usual, the oil industry would need to devote significant petroleum infrastructure, totaling approximately 323 million barrels of refining capacity, if it wished to meet the state's estimated transportation fuel

demand of 23 billion gallons per year in 2020 solely from petroleum sources. The value of this capacity, either within California or elsewhere, could range between \$8 billion and \$18.6 billion.²⁶ Therefore, any considerations about whether to move forward with aggressive petroleum reduction policies should, at a minimum, be weighed against this cost.

The State's Stationary Energy Model: Diversify and Consume Efficiently

When faced with energy challenges on the stationary side, the state applied a straightforward strategy: Diversify and consume efficiently. Today, California is powered by the most diverse electricity fuel sources in the world, including natural gas, coal, hydroelectric, nuclear, and a significant amount of renewables such as wind. This diversification is the result of effective policies and public investment. One policy example, known as a public goods charge (PGC), created a fund of more than \$690 million per year fund that the state uses to invest in energy efficiency measures, renewable energy, and research and development projects that play large roles in the efficient growth and diversification of the state's energy supplies. This fund specifically targets adding renewable energy sources to the state's supply. In fact, it provides over \$140 million each year to do so.

The PGC's renewable energy target is augmented by the state's Renewables Portfolio Standard (RPS), which is another example of effective policy. This standard requires that all major utilities in the state generate at least 20 percent of their total electric supply portfolio from renewable sources by 2010. This requirement could result in the procurement of up to an additional 20,000 or more GWh of renewable energy each year.

California's leadership on energy policy and diversification has helped Californians' per-capita use of electricity remain more or less constant over the past thirty

²⁴ Currently, California imports more than 10 percent of its gasoline.

²⁵ CEC. Questions and Answers: California Gasoline Price Increases. [Online] http://www.energy.ca.gov/gasoline/gasoline_q-and-a.html

²⁶ State refineries currently refine 730 million barrels/year. Assuming a 52 percent conversion rate for crude oil into gasoline, the state will need 1.05 billion barrels/year of refining capacity to meet its business-as-usual 23 BGGE/year scenario, yielding a refining capacity shortfall of approximately 323 million barrels/year, or 885,000 barrels/day. The National Petrochemical Refiners Association estimates the cost of expanding capacity at existing refineries, and \$21,000 per barrel/day to build new refineries, yielding a total required state refinery investment between \$8 billion and \$18.6 billion.



years, while use has grown by 50 percent nationally. Accordingly, Californians have saved more than \$20 billion in electricity and natural gas costs since the PGC and RPS were established, a number that is predicted to climb an additional \$57 billion by 2011. One can predict that an increase in transportation efficiency measures that focus on diversifying California's transportation energy sources and increase the use of preferred fuels would contribute to this effect.

California Adopts Transportation Energy and AB 32 GHG Goals

California already has in place goals and legislation that can provide the framework for development of a diverse, efficient, and secure transportation energy model.

In 2000, the California legislature passed AB 2076.²⁷ This legislation directed the CEC and the Air Resources Board (ARB) to investigate and develop recommendations for the governor and the Legislature on a California strategy to reduce petroleum dependence. Based on this evaluation, they recommended that California adopt a policy to, by 2020, reduce petroleum use by 15 percent and increase use of alternative fuels to 20 percent (compared with 2003 levels). The process of transportation energy analysis and review related to these goals continues through Integrated Energy Policy Reports (IEPRs) released every other year by the CEC.

In Governor Schwarzenegger's response to the 2005 IEPR, he expressed his agreement that the state "should improve vehicle efficiency and diversify fuels." In particular, he asserted that the state should "adopt a goal of increasing the use of nonpetroleum fuels to 20 percent of on-road fuel consumption by 2020 and 30 percent by 2030 based on identified strategies that are achievable and cost-beneficial" and expressed his particular support for state fleet leadership on this issue and programs that inform and educate consumers on vehicular efficiency techniques.

The California legislature also passed and the governor signed the Global Warming Solutions Act²⁸ in early fall 2006. This act establishes a first-in-the-world comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of statewide GHG emissions. It codifies the governor's previously expressed goal by requiring the state's global warming emissions to be reduced to 1990 levels by 2020, which represents a 25 percent reduction below business as usual.²⁹ The Act can apply to a wide range of GHG sources and will most likely help drive the use of innovative, low-carbon methods of energy production such as renewable approaches. One thing is certain: If the state is to meet this ambitious AB 32 GHG goal and the IEPR goals, transportation energy diversity and efficiency will have to play a significant role.

The State Can Once Again Lead the Nation

More than forty years of leadership and precedent indicate California not only can succeed in securing its transportation energy future without waiting for federal action, but also can reap multiple benefits by doing so and prompt the rest of the nation to follow its lead.

Because of California's severe environmental problems and historical actions to address them, the state was granted a waiver under the 1970 Clean Air Act that allows it to pursue clean air policies that are more aggressive than the federal government's. Since then, California has repeatedly passed automotive standards that exceed federal standards and set the model for national action.

In the 1960s, California's actions to control automotive pollution prompted the federal government not only to set automotive emission standards, but also to model them after the state's. This demonstration of leadership was repeated in the early 1990s and again in the late 1990s when, frustrated by a

²⁷ AB 2076, Shelley, Chapter 936, Statutes of 2000

²⁸ AB 32, Nunez and Pavley, Chapter 488, Statutes of 2006

²⁹ California Air Resources Board. AB 32 Fact Sheet. [Online] <http://www.arb.ca.gov/cc/factsheets/ab32factsheet.pdf>



lack of federal action, a handful of northeastern states adopted California's Low Emission Vehicle 1 and 2 programs, an action that prompted the creation of the National Low Emission Vehicle program and eventually the stringent Tier 2 national program, which significantly reduced vehicular emissions and air pollution nationwide.

One of California's influential acts regarding automotive standards was passed in 2002. Dubbed the Vehicle Global Warming Law,³⁰ this legislation places caps on average fleet vehicular GHG emissions. While the regulation is currently facing legal challenge, California's leadership was once again demonstrated by the fact that ten other states, representing one-third of the U.S. population, adopted this program. If previous experience serves as an indicator, one might predict that it's only a matter of time until the federal government implements a similar national program.

Other examples of independent California action and leadership are plentiful. In the late 1980s, Governor George Deukmejian signed the California Clean Air Act and the ARB approved the reformulated gasoline program, paving the way for federal adoption of the Clean Air Act Amendments and a national reformulated gasoline program in the early 1990s. California also leads the nation on appliance efficiency, building efficiency, coastal protection standards, and, as previously mentioned, stationary energy policy.

Today, the state is establishing partnerships around the country and the world in order to meet its AB 32 GHG goals. In October 2006, Governor Schwarzenegger announced that he will work with New York and other eastern states to create markets to cut GHG emissions. In August 2006, the governor signed an agreement with British Prime Minister Tony Blair to collaborate on technologies, scientific development, and the creation of market-based mechanisms as well as to engage rapidly grow-

ing countries such as China and India in combating global warming. Clearly, Governor Schwarzenegger is following California's tradition of environmental and energy leadership.

Solutions Are Ready to Go, Can Support a "California Advantage"

With such a track record, California is ideally situated to aggressively pursue a comprehensive transportation energy policy, to reap the "early adopter" rewards commonly associated with first-mover status, and to shape a national transportation energy policy in its vision. Fortunately, California doesn't have to wait for technological solutions or "silver bullets" to be discovered before it moves forward with its transportation energy security goals. The solutions that can make a difference are here today and ready to go, and their increased use can inoculate and grow California's economy while buffering the state against the negative consequences associated with an excessive reliance on oil, thereby establishing a "California advantage."

The solutions that can make a difference in the 2020 time frame range from conventional vehicular technologies that can be improved with relatively minor and inexpensive modifications to more advanced solutions such as the following: Hybrid electric systems that combine conventional fuel engines with electric motors for superior efficiency; renewable fuels that are produced from organic matter like crops and waste material; natural gas that comes from North America and reduces GHG emissions by over 20 percent compared with gasoline; smart growth development that builds more efficient ways to live; advanced transit technologies like Bus Rapid Transit that creates stylish "rails on wheels"; and many others.

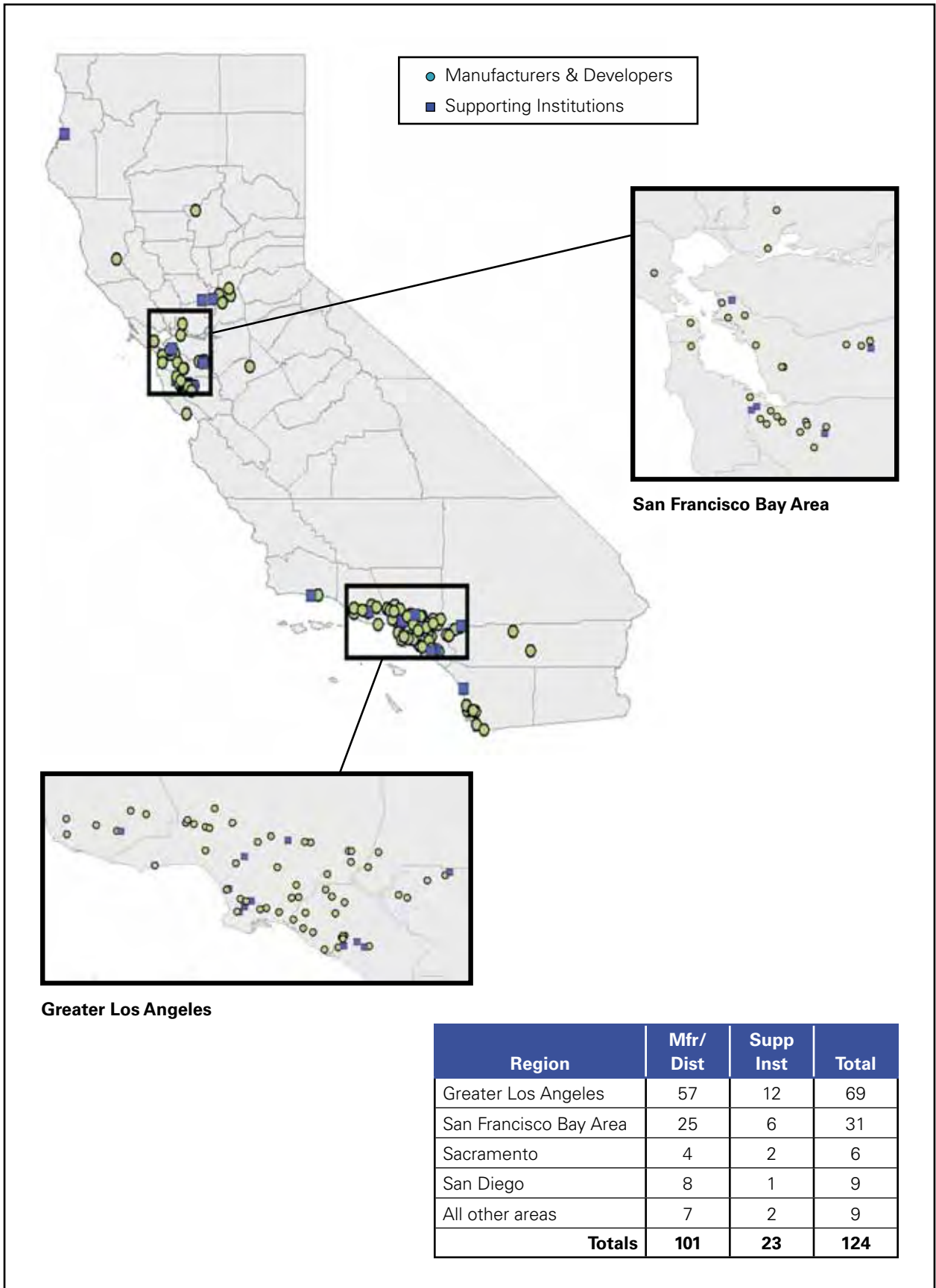
Furthermore, greater use of these technologies can assist in the creation of a "California advantage" by buffering the state against the negative conse-

³⁰ AB 1493 Pavley, Chapter 200, Statutes of 2002

³¹ Peak, Matt, et al. California's Clean Vehicle Industry. CALSTART, Inc. 2004. [Online] http://www.calstart.org/info/publications/Californias_clean_vehicle_industry/Californias_Clean_Vehicle_Industry.php



Picture 2: 124 Clean Car Technology Cluster Manufacturers, Developers, and Supporting Institutions Identified in California





quences associated with an excessive reliance on one type of fuel, such as oil, while growing the economy. A 2004 CALSTART study found that California has key competitive advantages in clean vehicle technologies.³¹ Specifically, the report found that California is already an acknowledged world leader in advanced technologies, electronics, software, and engineering and design. These skills and demonstrated strategic strengths align closely with the skill sets needed to create the new technologies and products required for more efficient and AFVs.

The CALSTART study, titled *California's Clean Vehicle Industry*, surveyed over 100 clean vehicle technology companies and supporting institutions that are currently doing business in the state. The location of these companies, termed the Clean Car Technology Cluster, is illustrated in **Picture 2**. When asked to assess the effect on their business of implementing more efficient and/or alternative fuel technologies in vehicles, the companies surveyed overwhelmingly responded that such a requirement would benefit them by increasing both job growth and investment.

The study also highlights the market potential that comes with being a recognized leader in

a growing industry. For example, on automotive emission standards, California's LEV II automotive emission standards (adopted in 1998) served as the model for national standards. LEV II spurred innovation that resulted in an estimated \$550 million in additional revenues to the California air pollution control industry from 1999 to 2002, equaling nearly \$140 million per year.³²

Accordingly, the study cites a potential \$20 billion automotive technology market that would be made possible by aggressively pursuing transportation energy security measures. It also illustrates further growth opportunities prompted by developing countries' increasing interest and involvement in solving their petroleum dependence problems. For example, China has a rapidly growing car market that will equal current U.S. sales by 2015, and the country already has policies in place to promote clean and efficient vehicle technologies.

With global trends driving new technologies to market, California's Clean Car Technology Cluster is well positioned to add high-quality jobs and investments to California's economy. All that's needed to make this happen are appropriate state leadership, smart policies, and targeted investment.

³² Ferrier, Grant, and Killion, Mariko. *The Economic Contribution of the California Air Pollution Control Industry*. Environmental Business International, Inc. October 2004; p. 36.



Overall California Advantage: Transportation Energy Diversification and Efficiency • Reduced Price Volatility • Economic Stability and Growth

Category	Technology	Technology Description/Status	Additional California Advantages
<p>Vehicular Efficiency</p>	<p>Conventional technologies</p>	<ul style="list-style-type: none"> · Variable valve timing, continuously variable transmissions, turbochargers, 6–8 speed automatic transmissions, lightweight materials, efficient tires, aerodynamic designs, and diesel engines are already used in some vehicles. 	<ul style="list-style-type: none"> · Greater use in California could significantly increase vehicles' efficiency (diesel engines are 30% more efficient than gasoline engines). · California is home to many conventional technology suppliers, such as Honeywell Turbo Technologies in Torrance.
<p>Vehicular Efficiency</p>	<p>Electrically driven vehicles</p>	<ul style="list-style-type: none"> · Mild and full hybrids are becoming increasingly common. · By 2008, California will have about 110,000 regular hybrids on its roadways. Demand for these vehicles is strong and growing. · Hybrid technology is emerging in the trucking industry; every major truck manufacturer has at least produced a working prototype vehicle. Hybrid buses are the fastest growing segment in the transit industry. · Plug-in hybrid-electric vehicle (PHEV) concept in demonstration; General Motors will unveil a PHEV prototype at the Detroit auto show in January 2007. · New technologies make battery electric vehicle resurgence possible. · Fuel cell technology cost, efficiency, and durability are progressing. · Honda, GM, and DCX are all planning large-scale fuel cell vehicle demonstration programs; fuel cell bus programs are expanding in Europe and North America. 	<ul style="list-style-type: none"> · The North American headquarters of the two largest hybrid vehicle manufacturers, Toyota and Honda, are located in California. · The PHEV movement originated in California; UC Davis has nation's leading PHEV engineering program. · Tesla, Wrightspeed, and other battery electric vehicle and component manufacturers call California home. · California-based ISE, Enova Systems, and Maxwell Technology are leading suppliers to the emerging heavy-duty hybrid-electric vehicle industry. · The California Fuel Cell Partnership and the Hydrogen Highway combined represent the largest single state fuel program in the nation; California has the largest fuel cell bus program as well.
<p>Fuel Diversity</p>	<p>Natural gas and propane</p>	<ul style="list-style-type: none"> · The technology is well developed and proven. · CO₂ emissions are about 23% lower than equivalent gasoline vehicles. · 26,700 natural gas vehicles are on the road in California today; in 2004, there were 365 public and private compressed natural gas refueling stations. · California is home to the largest natural gas transit fleet. · Represents a small fraction of California's total overall transportation energy consumption. · Sweden and other nations have demonstrated the economic feasibility of converting biomass into renewable methane; there are more than 8,000 vehicles operating on biomethane in Sweden today; the gas utility in Gothenburg set a goal of 100% renewable methane by 2050. 	<ul style="list-style-type: none"> · California is the state with the most public natural gas refueling stations. · The largest provider of natural gas for transportation in North America, Clean Energy, is based in Seal Beach. · Interest in renewable methane (biomethane) is growing among businesses and agriculture. · California utilities are seriously exploring the development of biomethane from dairy cows and other sources; California has the largest dairy cow population in the country. · California signed a memorandum of understanding with Sweden to pursue biomethane.

	<p>Fuel Diversity</p>	<p>· California already blends over 1 billion gallons of conventional ethanol each year into its gasoline. Production level is expanding rapidly.</p> <p>· Ethanol vehicle technology is currently simple and the cost is negligible.</p> <p>· Advanced ethanol technologies are making progress and could displace significant levels of petroleum.</p> <p>· “Clean diesel” vehicles will be sold in California in 2009, and are highly compatible with renewable diesel fuels.</p> <p>· Longer-term prospects indicate that “biomass to liquid” (BTL) fuels can be cost-effective with oil priced above \$50 per barrel.</p> <p>· Hydrogen produced from renewable energy sources such as solar and wind is becoming increasingly cost competitive with other methods of hydrogen production.</p>	<p>· California’s cellulosic resources could support production of 1.5 billion gallons/year now and potentially 3 billion gallons/year of renewable fuels.</p> <p>· Potential economic benefits to California from ethanol production are estimated at \$5 billion over a twenty-year period; could create 8,000 new jobs.</p> <p>· California is the number-one agricultural state in the nation, receiving \$31.8 billion for its products in 2004.</p> <p>· California’s strong biotech industry is poised to help solve production issues.</p> <p>· California’s venture capital community understands the value of biofuels and is investing record sums in the field.</p>
<p>The Need to Drive</p>	<p>Smart Growth</p>	<p>· Various communities in the United States have already implemented smart growth policies.</p> <p>· Some California communities that have implemented smart growth to some extent are Windsor, Oakland, San Mateo, and San Francisco.</p> <p>· Smart growth is not pervasive in California. The norm is sprawl, which leads to congestion.</p>	<p>· Recently passed state bonds provide substantial opportunities to promote smart growth: Housing Bond contains \$850 million for local infrastructure, infill, and parks and \$300 million in grants for “transit-oriented development”; there is \$90 million for sustainable communities in the Water Quality, Parks, and Conservation Bond.</p> <p>· Reduced congestion could save people and businesses approximately \$17 billion and more than 665 million gallons of fuel annually.</p>
<p>The Need to Drive</p>	<p>Bus Rapid Transit</p>	<p>· New corridors are under development in Northern and Southern California.</p> <p>· Allows high-load and improved performance for relatively low initial investment.</p> <p>· Stylish and convenient designs and features are popular with riders.</p>	<p>· Allows faster introduction of transit alternatives to passenger cars in California.</p> <p>· Various reports show that encouraging people who would normally drive to use public transportation (such as Bus Rapid Transit), bicycle, or to walk would significantly reduce GHGs.</p>





Primary Actions

DETAILED DESCRIPTIONS AND SUPPORTING DATA



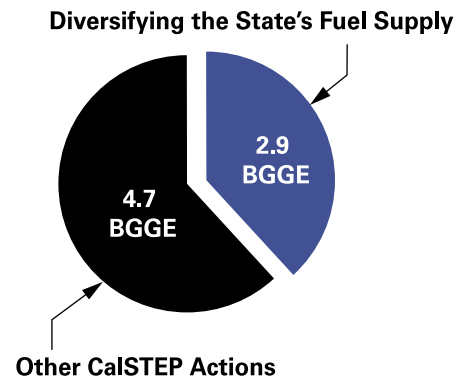


Working through its deliberative process—in which progress was measured in terms of economic, geopolitical, and environmental costs and benefits—CalSTEP has identified three high-priority actions that it urges the state to immediately take to begin moving towards a secure and prosperous transportation energy future.

1	Codify Governor Arnold Schwarzenegger’s fuel diversity goal by implementing a fuel-neutral, minimum-pooled Alternative Fuels Portfolio Standard (AFPS) of at least 10 percent by 2012 and at least 20 percent by 2020 that will increase the availability of and access to a diverse array of alternative fuel stations.
2	In support of the directives outlined in Governor Schwarzenegger’s Executive Order S-17-06, which focuses on developing market-based solutions to global warming, implement an Energy Security Tax Relief and Realignment (ESTRR) program consisting of a Foreign Oil Security fee coupled with a tax rebate for all California taxpayers. This would use market mechanisms and price signals to significantly increase the efficient use of petroleum and help protect efficient-transportation capital investments.
3	Initiate a Smart Communities program that encourages energy-efficient and climate-friendly land-use policies and practices by providing new state transportation funding to local governments to implement regional blueprints that reduce the need to drive.

Alternative Fuels Portfolio Standard

Today, California motorists are forced to deal with what can only be described as a “monofuel” culture dominated by gasoline and diesel fuels. In 2004 there were 9,630 gasoline refueling stations in



Diversifying the State’s Fuel Supply = 2.9 BGGE
 CalSTEP’s actions to diversify California’s fuel supply would reduce annual petroleum consumption by 2.9 BGGE.



California.³³ By comparison, there were only about 365 compressed natural gas (CNG) stations (about 140 of them publicly accessible), 340 electric vehicle charging stations, 235 liquefied petroleum gas (LPG) stations, 40 liquefied natural gas (LNG) stations, 25 publicly accessible biodiesel stations (at blends of 20 percent or higher), and one publicly accessible E85 ethanol refueling station.

In other states and nations, as the following examples illustrate, motorists have options when they pull up to the pump:

- Targeted state-level programs that focus on expanding agricultural development and renewable fuel production have led Minnesota to take the lead and jump-start its fuel diversity by implementing over 200 E85 stations; Illinois has more than 100.
- Prompted by the two oil shocks of the 1970s, Brazil now blends gasoline with 25 percent ethanol, and pure ethanol stations are as common as gasoline stations. Nearly 80 percent of new car sales in Brazil are “flexible fuel” capable, which allows these vehicles to run on any combination of gasoline and ethanol. Motorists can choose for themselves, based on price and preference, which fuel to buy on any given day. Ethanol now makes up over 15 percent of transportation fuel consumption and is partially responsible for the country’s transportation energy self-sufficiency in 2006.³⁴
- Sweden not only benefits from the importation of Brazilian ethanol, but has also created a dedicated biomethane infrastructure. Renewable fuels such as biomethane and ethanol are expected to be offered at 2,400 of Sweden’s 4,000 gas stations by 2010. The popularity of these fuels and the vehicles that run on them, combined with a law that requires gas stations that sell more than 3,000 cubic meters of gasoline or diesel fuel per year to also provide a renewable fuel, is part of the country’s strategy to break its dependence on fossil fuels by 2020.
- Iceland has set out to become the first nation in the world to power its economy entirely with hydrogen. In 1999, the country established Icelandic New Energy, which is a cooperative involving the Icelandic government, universities, research institutions, business leaders, and the companies Shell, DaimlerChrysler, and Norsk Hydro. The cooperative’s goal is to power the country’s transportation system and fishing fleet entirely with hydrogen, thereby saving the country nearly two-thirds of the \$200 million it spends each year on imported fossil fuels, attracting new foreign investment, and developing the capacity to export hydrogen.
- The global natural gas vehicle (NGV) population increased by 65 percent over the past three years to 4.6 million CNG vehicles,³⁵ while the global natural gas station population increased by 40 percent. In recent years, the NGV population in Argentina, Brazil, and Pakistan has grown by 45, 57, and 283 percent, respectively. India has the largest natural gas bus fleet in the world, with more than 10,000 buses in service in New Delhi. In Italy, about a quarter of a million vehicles are running on CNG. In China, Beijing has more than 2,400 natural gas buses in service.³⁶ German registrations of CNG passenger cars in October

³³ Argyropoulos, Paul N., et al. Analysis of U.S. Retail Market: Consumer Accessibility to On-Highway Diesel Fuel. Hart Downstream Energy Services. March 2005: p. 14.

³⁴ Statement by David G. Victor of Stanford University, as quoted in: Romero, Simon. “Much Talk, Mostly Low Key, About Energy Independence”. The New York Times. February 1, 2006.

³⁵ International Association for Natural Gas Vehicles. September 26, 2006.

³⁶ Saw, Guan. Key Drivers for Natural Gas Powered Buses in China. International Association for Natural Gas Vehicles. 7 December 2005. [Online] http://www.ngvglobal.com/index.php?option=com_content&task=view&lang=en&id=455&Itemid=2



2006 climbed more than 300 percent over the October 2005 figure, and are up 47 percent year-over-year. There are now more than 50,000 NGVs on the road in Germany. **Table 1** lists some of the countries that experienced notable NGV growth in recent years.

With the implementation of thoughtful, well-crafted policies, California can also diversify its fuel supply and provide motorists with options when they refuel. The primary action in this category that CalSTEP identified as able to bring California up to or beyond par with the rest of the nation is a pooled AFPS.

AFPS Follows Successful AB 32 Precedent, Codifies Governor's Alternative Fuel Goal

In June 2005, Governor Schwarzenegger established state-level GHG emissions reduction goals that would reduce emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. In response, the legislature

proposed AB 32 in 2006. The bill, which came to be known as the Global Warming Solutions Act, codified the governor's goals, established the framework for market-based GHG reduction strategies, and set in motion the process for ensuring that these goals become reality. CalSTEP believes that the legislature and the governor should take the same action regarding transportation fuel diversification.

In his response to the 2005 IEPR, Governor Schwarzenegger asserted that the state should "adopt a goal of increasing the use of nonpetroleum fuels to 20 percent of on-road fuel consumption by 2020 and 30 percent by 2030 based on identified strategies that are achievable and cost-beneficial." CalSTEP applauds the governor's establishment and endorsement of this goal and believes that the goal should be codified, as was done with AB 32, through an AFPS that would require refiners to provide 10 and 20 percent of the state's transportation energy as ARB-approved alternative fuels by 2012 and 2020, respectively.

Table 1: Notable International Natural Gas Vehicle Growth

Country	NGVs 2003	NGVs 2006	Stations 2003	Stations 2006
Argentina	1,000,000	1,457,118	1,000	1452
Brazil	550,000	1,011,206	565	1138
Pakistan	350,000	700,000	200	766
India	137,000	222,222	116	192
China	69,300	97,200	270	355
Egypt	44,064	62,702	75	91
Germany	15,000	50,000	337	650
Bangladesh	13,000	41,314	16	122
Global Total	2,814,438	4,642,720	6,455	9,005

Source: *Natural Gas Vehicles for America, Trägerkreises Erdgasfahrzeuge*



Other States Are Moving Forward; California Should Too

In addition to the federal government’s recently enacted renewable fuel standards,³⁷ several states around the nation have adopted their own aggressive yet feasible renewable fuel standards, which are similar to an AFPS but more limited, for they

require the blending of renewable fuels like ethanol and biodiesel with petroleum fuel. These standards usually dictate the level of renewable fuel that a state needs to blend into gasoline and/or petroleum diesel. **Table 2** illustrates the level of activity in other states.

Table 2: State Renewable and Other Fuels Standards

State	Level	Date of Enactment
Minnesota	E10 E20	Current 2013
Hawaii	Alternate fuels: 20% highway fuel demand by 2020	2006
Illinois	10% of total sales 15% of total sales	2008 2012
Missouri	E10	2008
Washington	Ethanol: 2% of total sales Biodiesel: 2–5% of total sales	2008, or when state demonstrates sufficient in-state production
Colorado	E10 E20	2009 2013
Iowa	10% of total sales 25% of total sales	2009 2020
New Mexico	E10 B2	2009
Kansas	E10 B2	2010
Louisiana	E2 B2	After sufficient in-state monthly production volumes are met
Montana	E10	When state achieves minimum production level

Source: Green Car Congress

CaISTEP believes that California should go beyond a simple directive to blend renewable fuels with petroleum fuels and adopt a broader and more flexible AFPS that could include other nonpetroleum ARB-approved alternative fuels and blends such as natural gas and propane. Such a policy would conform with

the governor’s broad alternative fuel goals, while providing flexibility for industry to choose the most cost-effective and expedient solutions that meet the requirements. Furthermore, an AFPS allows time for resolving air pollution uncertainties associated with low-blend biofuels (progress is currently being made,



but allows the ambitious goal to be met regardless of whether these uncertainties are resolved.

The use of a broader AFPS isn't without precedent. Hawaii enacted an AFPS³⁸ requiring that 10 percent of highway fuel demand be met by alternate fuels by 2010, 15 percent by 2015, and 20 percent by 2020. In September 2006, Connecticut Governor M. Jodi Rell unveiled an energy program for the state that, among other elements, establishes a 20 percent minimum alternative fuels component for all commercial transportation fuels sold in the state by 2020. California's adoption of this policy would align the state with these other transportation energy leaders while sending a clear message that the state is serious about meeting the governor's targets.

Implementing an AFPS

The implementation of an AFPS would be modeled on the national structure to implement a renewable fuel standard. The AFPS approach would require any party producing gasoline for consumption in California—including refiners, refinery terminals, and importers—to be subject to a 10- and 20-percent alternative fuel volume obligation in 2012 and 2020, respectively. The 10 and 20 percent figures would be applied to on-road gasoline and diesel fuel consumption only. Small refiners and small refineries, as defined by the Clean Air Act Section 211(o)(a)(9) and Section 1501(a) of the Energy Policy Act of 2005, would be exempt from meeting the 2012 alternative fuel requirements.

To facilitate the practicality of this requirement, the CEC would design and implement a credit trading program that allows obligated parties to comply with the AFPS standard through the purchase of tradable credits if they cannot or do not wish to blend or sell alternative fuels. Such a system would also allow independent providers and/or obligated parties to sell surplus credits accumulated through overcompliance with the standard. Any alternative fuel provider would be able to generate credits, but the CEC would establish the conditions under which the credits could be generated and how the credits could be transferred from one party to another.

The CEC would also be responsible for establishing compliance and enforcement provisions, such as for facility registration, record keeping and reporting requirements, program enforcement, and various fuel tracking mechanisms. These provisions would enable the credit trading program to function properly and would ensure an adequate foundation for enforcement.

Potential Ways of Meeting Requirements

While the AFPS is inherently flexible and could be met by using any methods that importing companies, refineries, and refinery terminals chose, the following two hypothetical examples illustrate the feasibility of meeting the overall requirements and approaches that could be taken:

³⁸ Act 240, SLH2006



Hypothetical Examples for Meeting the AFPS 2012 and 2020 Requirements

10 Percent by 2012 (0.8 BGGE)		20 Percent by 2020 (2.9 BGGE)	
Action	Petroleum Reduction (BGGE)	Action	Petroleum Reduction (BGGE)
E10 statewide	0.4	E10 statewide	0.5
B5 statewide	0.17	B20 in all diesel vehicles	0.9
Natural gas vehicles 3% of medium- and heavy-	0.1	Natural gas vehicles 11% of medium- and heavy-	0.9
300,000 vehicles running on E85	0.12	2.5 million light-duty vehicles running on E85	1.0

Summary: Alternative Fuels Portfolio Standard

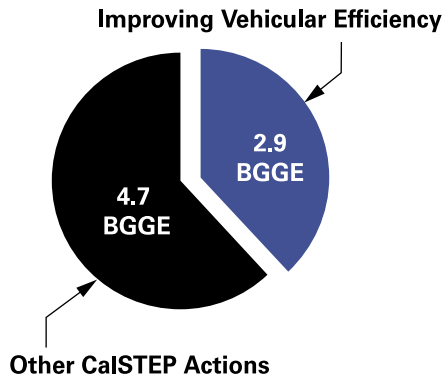
Proposed Action	Implement a pooled alternative fuels standard of 10 percent by 2012 and 20 percent by 2020
Objectives	<ol style="list-style-type: none"> 1. Set a firm target and commitment by the state to implement alternative fuels. 2. Utilize a flexible policy mechanism that is superior to a renewable fuel standard to achieve this goal. 3. Create a credit trading program to facilitate this process.
Outcome in 2020	Alternative fuels provide 20 percent of all transportation fuel in California
Projected Annual Petroleum and GHG Reductions	2.9 BGGE ³⁹ of petroleum and 15 million tons of GHGs in 2020 ⁴⁰
Estimated Annual Cost	Costs to the state government are minimal
Implementation Plan or Proposed Authority	CEC
Responsible/Affected Parties	Importing companies, refineries, and refinery terminals
Proper Avenue of Enactment	Legislation

³⁹ This number can vary based on the strategies chosen to meet the requirements; 2.9 BGGE is based on the aforementioned hypothetical strategy.

⁴⁰ 15 million tons of GHG emissions reduced is based on the aforementioned hypothetical strategy and assumes a 50-50 mix of corn-based and cellulosic ethanol in 2020. GHG reduction numbers taken from: Farrell, Alexander E. et al. "Ethanol Can Contribute to Energy and Environmental Goals." Science Magazine. January 27, 2006.



Market-Based Energy Security Tax Relief and Realignment Program



Improving Vehicular Efficiency = 2.9 BGGE

CalSTEP's actions to improve vehicular efficiency would reduce annual petroleum consumption by 2.9 BGGE.

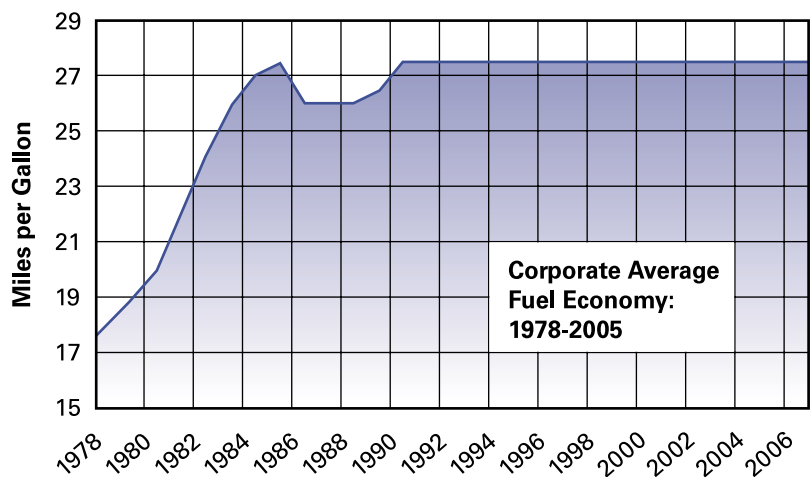
While California has an EPA waiver to pursue environmental standards that are more stringent than the federal government's, the waiver doesn't apply to vehicular fuel economy standards. Consequently, California is subjected to the same federal vehicular fuel economy standards as other states, standards that are set by the National Highway Traffic Safety Administration (NHTSA). Unfortunately, the main federal policy tools, known as Corporate Average Fuel Economy (CAFE) standards, have yielded little real-world fuel economy improvement for light-duty passenger cars over the past twenty years: In 1987, the year when overall fuel economy for cars and light trucks in the U.S. market was at its highest, these vehicles averaged 22.1 mpg. The average in 2004 was 20.8 mpg. As **Graph 7** indicates, CAFE standards have remained the same since 1985, and even declined for a brief period.

Recently, action was taken to improve light-duty truck fuel economy standards through a process

administered by the NHTSA. Through this process, the standard for light-duty trucks (those weighing less than 8,500 pounds) will increase from 20.7 to 22.5 mpg in 2008, to 23.1 mpg in 2009, and to 23.5 mpg in 2010, after which the standards move to an individualized system based on vehicular footprint size.⁴¹ Still, it is clear that significant progress on vehicular efficiency—progress that goes beyond the NHTSA's standards and that meaningfully assists the state in achieving its transportation energy and GHG goals—won't be achieved unless there is a significant increase in the appearance of efficient technologies in vehicles. This could be prompted by a decrease in some of these technologies' costs and greater public demand for efficient vehicles.

CalSTEP has identified smart primary and supporting actions that, if fully implemented, would create these conditions and spark the efficient use of petroleum in new and existing vehicles while helping to protect investments in efficient transportation technologies. CalSTEP's policies and programs would also allow for the preservation of vehicular safety, consumer choice, and flexible market-based responses. Pursuing such mechanisms is a good way to drive these goals

Graph 7: CAFE Standards for Passenger Cars Have Not Changed Since 1985



Source: National Highway Traffic Safety Administration

⁴¹ Footprint is listed as square feet and is calculated by multiplying track width (the distance between the centerline of the tires) and wheel base (the distance between the centers of the axles).



in the absence of federal efficiency requirements. The primary action in this category is the implementation of a market-based ESTRR program.

Promoting Efficient Fuel Use Through ESTRR

Unstable gas prices are a significant detriment to California's economy, in terms of both their direct cost and the uncertainty that variable prices have on investments in substitutes and efficiency. Over the past eight years, gasoline prices in California have fluctuated between an average of \$1.16 per gallon in 1998 and \$2.86 per gallon so far in 2006.⁴² More recently, gas prices swung between an average of \$2.44 in February 2006 to an average of \$3.33 per gallon in May 2006 (and significantly higher in certain areas) then back down again to an average of \$2.43 by the end of October 2006.⁴³ Under this scenario, where gasoline prices can't be predicted a on day-to-day basis much less year-to-year, individuals and companies are unsure whether to develop or adopt advanced and efficient transportation technologies: They don't know what the payback will be, or whether gasoline prices will collapse altogether, leaving them high and dry, as happened in the 1980s.

Consequently, efforts to introduce costly new and efficient transportation technologies have soared during times of higher oil prices, then been scrapped as oil producers increased supply to drive down prices. To a lesser degree, this effect is already taking place as fuel prices retreat from their summer 2006 highs. According to a Cars.com Consumer Search Index report, searches for the most fuel-efficient cars declined the most in fall 2006, while searches for luxury SUVs with lower fuel economy increased significantly.⁴⁴ This effect is confirmed by the fact that the light-duty truck category, which includes less-economical pickups, SUVs, and vans, surged by

14.8 percent while sales of more-economical cars fell by 2.9 percent⁴⁵ in October 2006 after gasoline prices fell by 17 percent in September.⁴⁶ This surge was even greater at some companies, with General Motors truck sales up 32.9 percent.⁴⁷

Realized and potential drops in oil prices significantly reduce the private sector's investment in alternative fuels and efficient technologies, as well as their implementation. While annual 1- to 1.5-percent vehicular efficiency gains from technology can be used to improve fuel economy, performance, or a combination of both, public demand for larger and higher-performance vehicles is directing much of these efficiency gains toward technologies that enable manufacturers to provide these types of vehicles. CalSTEP believes that petroleum prices stabilized above \$3 per gallon would help raise demand for more economical vehicles and therefore prompt automobile manufacturers to direct some or all of their annual efficiency gains into fuel economy-enhancing technologies, while protecting manufacturers' and motorists' investments in these technologies.

Accordingly, CalSTEP recommends that the state explore and implement an ESTRR program to help ensure that investments in advanced and efficient vehicular technologies and alternative fuels aren't abandoned. Under ESTRR, California would implement a Foreign Oil Security fee should retail prices of petroleum fuels drop below an initial price floor: the average price of fuel over the six months prior to implementation or \$2 per gallon, whichever is greater. This price floor would increase by 1 cent per month for ten years to a maximum level of \$1.20 per gallon above the initial price floor, while each step of the way returning all collected funds to all California taxpayers through a tax rebate or credit, which taxpayers could then use as they wish.

⁴² CEC. Historical Yearly Average California Gasoline Price per Gallon 1970 to 2006. [Online] http://www.energy.ca.gov/gasoline/statistics/gasoline_cpi_adjusted.html

⁴³ Ibid., and CEC. California Average Weekly Retail Gasoline Prices. [Online] http://www.energy.ca.gov/gasoline/retail_gasoline_prices.html

⁴⁴ Green Car Congress. Online Searches for Fuel-Efficient Vehicles Decrease with Price of Gas. October 9, 2006. [Online] http://www.greencarcongress.com/2006/10/online_searches.html#more

⁴⁵ Merx, Katie, and Webster, Sarah A. "Lower gas prices spur rebound in truck sales." Detroit Free Press. November 2, 2006.

⁴⁶ Hagenbaugh, Barbara. "Demand for Gasoline Surges As Prices Take a Dive." USA Today. October 19, 2006.

⁴⁷ Ibid.



The Foreign Oil Security fee could be implemented at the retail level by assessing an incremental cost per gallon of petroleum fuels, or at the wholesale level by assessing an incremental cost per barrel of oil on those who sell petroleum fuels in the state. This could be done by setting the price floor at the average oil price over the six months prior to implementation and then raising it by 40 cents per barrel each month for ten years. Either way, the price that motorists see at the pump would be approximately the same.

The size of the ESTRR rebates would be proportional to the size of the fee and would come in the form of individual tax rebates, state income tax credits, or comparable measures. The Foreign Oil Security fee would not apply to ARB-approved alternative fuels, but motorists who use alternative fuels would receive the same tax rebate. **Table 3** illustrates how the revenue collected from a Foreign Oil Security fee would match the revenue returned to motorists, should the price of petroleum drop below the point that would trigger its imposition.

Table 3: All California Taxpayers Receive Rebates Under ESTRR

Retail Cost of Petroleum Fuel	...Then the Foreign Oil Security Fee Equals:		...And the Tax Rebate Equals:	
	\$ per Gallon	Total Revenue (\$B)	\$ per Person ⁴⁸	Total Tax Relief (\$B)
\$2.80/gallon	\$0.40	6.16	\$201	6.16
\$2.40/gallon	\$0.80	12.32	\$402	12.32
\$2.00/gallon	\$1.20	18.48	\$603	18.48

Fully Phased-in Realignment Impacts of ESTRR in 2020

Source: California Energy Commission, U.S. Census Bureau

While recognizing that price signals are the best way to change consumer behavior, CalSTEP also recognizes that increased petroleum prices, even when combined with tax cuts or rebates, are often not considered politically feasible. However, there appears to be strong support for this concept within the business and environmental communities. CalSTEP therefore believes that a strong bipartisan coalition could be organized to pursue the ESTRR concept.

CalSTEP proposes this action take place in conjunction with the directives outlined in Governor Schwarzenegger’s Executive Order S-17-06, which focuses on developing market-based solutions to global warming. Among other things, it calls for the creation of a Market Advisory Committee to make recommendations to the ARB on or before June 30, 2007, on the design of a market-based compliance program to support the state’s AB 32 Global Warming Solutions Act activities.

Foreign Security Fee Means More Freedom from the Middle East and Money in Taxpayers’ Pockets

While the stable investment climate created by ESTRR would significantly benefit California’s Clean Car Technology Cluster and provide associated economic growth, all motorists would be better off through the program.

The ESTRR program will significantly advance the use of efficient vehicular technologies in California, making these technologies more common in all types of vehicles, without compromising consumer choice or safety. The potential imposition of a Foreign Oil Security fee if retail gas prices fall below the price floor in 2020 means that automakers would have sufficient time to plan their products to gradually incorporate more efficient technologies across all classes, for automakers would have certainty that prices would not be manipulated by OPEC or others to collapse the market for alternative fuels or efficient vehicles. It can be expected that such a policy, which provides an ample ten-year planning horizon, would lead to increases in vehicular

⁴⁸ Total tax relief divided by the population greater than 18 years old in California in 2020 (30.65 million).



fuel economy as well as more efficient fuel use in existing vehicles, thereby yielding a savings of 2.9 BGGE per year beginning in 2020 if implemented by 2010.

The tax rebates ensure that motorists keep more money in their pockets to save or spend on leisure goods or other expenses. Under the proposed scenario, if drivers maintain their current level of driving, the tax rebate would ensure that motorists' average aggregate out-of-pocket expenses for transportation fuel would remain the same. And drivers who choose to drive more efficient vehicles, drive less, or use alternative means of transportation would have the opportunity to save money and add to their income.

The tax rebates also mean that ESTRR is revenue neutral, deflating the argument that it is a proposed tax increase. With every dollar that the Foreign Oil Security fee generates, an equal amount is refunded to all California taxpayers. This rebate can be provided in different ways, from a simple check mailed to all taxpayers to a tax form credit. If the rebate is linked to the payroll tax, it could serve as a catalyst for job growth. Cutting the payroll tax is equitable to both rich and poor and, unlike income taxes, payroll taxes cannot be avoided. Also, cutting payroll taxes can be one of the most efficient ways the state can increase labor demand, employment, and overall economic growth. While payroll taxes are levied at the federal level, the state can take action by providing state tax rebates to both employers and employees.

If the notion of a price floor makes the challenges of implementing either of the two proposed options insurmountable, the state could simply implement the Foreign Oil Security fee on petroleum fuels or oil without setting a price floor, but still refund the

collected fees through tax rebates. While potentially easier to implement, this option might not guarantee the benefits that a predictable price floor would, for prices could collapse below the levels that would significantly spur investment in and adoption of technologies that enhance fuel economy. Still, it is an option worthy of consideration should the other prove infeasible.

California Is Well Positioned to Pursue ESTRR

California is well positioned to implement a Foreign Oil Security fee under the ESTRR program, should the need arise. The state's currently imposed gasoline tax level is among the lowest in the nation. According to the Tax Foundation, at 18 cents per gallon, California's 2005 per-capita fuel tax collection is ranked forty-sixth out of fifty states, and is a long way away from the 27 cents imposed by the per-capita leader, Montana,⁴⁹ and the 32.9 cents by the absolute leader, Wisconsin.⁵⁰

California's 18-cent per gallon tax is on top of federal and sales taxes, which bring the total amount of gasoline taxes that Californians pay to approximately 54 cents per gallon.⁵¹ This compares with \$4.24 per gallon in Britain and \$3.99 per gallon in Germany—two countries with significantly greater average vehicle efficiency and more practical public transport systems. Such a situation appears to be quite a paradox for a state engaged in a forty-year effort to find alternatives to oil, and with a history of repeatedly increasing taxes on other social ills such as cigarettes.

⁴⁹ The Tax Foundation. State Motor Fuel Tax Collections By State, Fiscal Year 2005. 2005. [Online] <http://www.taxfoundation.org/taxdata/show/241.html>

⁵⁰ The Tax Foundation. State Sales, Gasoline, Cigarette, and Alcohol Tax Rates by State. December 31, 2005. [Online] <http://www.taxfoundation.org/taxdata/show/245.html>

⁵¹ CEC data as of November 13, 2006. [Online] <http://www.energy.ca.gov/gasoline/margins/index.html>



Bipartisan and Public Support for the ESTRR GHG and Petroleum Security Approach

In October 2006, the Council on Foreign Relations issued a report titled *National Security Consequences of U.S. Oil Dependency*. The organization is a nonpartisan resource for information and analysis composed of past and present world leaders from political, corporate, and academic arenas. Its board of directors includes Martin S. Feldstein, Richard Holbrooke, and Colin Powell, among others. The independent task force that produced the report was chaired by former Central Intelligence Agency Director John Deutch and former U.S. Secretary of Defense James R. Schlesinger. The report focuses primarily on domestic energy policy as a high-potential leverage point to prevent the further undercutting of U.S. foreign policy and national security.

The report states the unanimity of the task force “in concluding that stronger incentives are needed to encourage investment in energy efficiency and fuel switching” in the United States.⁵² The report also states the potential of higher petroleum fuel prices, achieved through programs like ESTRR, in achieving this goal. These would “encourage less driving as well as increased efforts by automakers to develop and market more fuel-efficient vehicles.”⁵³ An example scenario is cited where fuel prices average \$1 per gallon higher than unmodified retail costs. While this scenario is different than the ESTRR proposal in that it merely increases the retail cost rather than setting a price floor and providing a tax rebate, it still predicts that such a scenario could “reduce the use of gasoline by between 3 percent and 6 percent” in the near term and eventually by about 16 percent overall.⁵⁴

Alan Greenspan, former chairman of the Federal Reserve, has also advocated for an increase in gasoline taxes on behalf of national security. In September 2006, he responded “with atypical clarity” to a question about gasoline taxes by saying that such taxes are “the way to get consumption down. It’s a national security issue.”⁵⁵ In lobbying for a sustained level of gasoline prices as a way to promote efficient vehicle technologies and reduce gasoline consumption, Greenspan joins other notable traditionally antitax economists such as N. Gregory Mankiw, the Harvard economist who served as chairman of President Bush’s Council of Economic Advisors; Andrew A. Samwick, chief economist on the Council of Economic Advisors from July 2003 to June 2004; and the aforementioned Martin S. Feldstein.⁵⁶

Fortunately, research indicates that the public is ready for a politician or political party to fulfill these notables’ wishes and step forward with a comprehensive measure like ESTRR to increase transportation energy security. In a February 28, 2006, New York Times/CBS poll, 55 percent of respondents supported paying higher gasoline prices if the increase was linked to a reduction of foreign oil dependence, while 37 percent were opposed. Even more respondents supported paying higher gas prices if it helped reduce global warming, with 59 percent in favor and 34 percent opposed. The poll revealed that the key to exercising such leadership comes down to how the program is framed. If the measures were linked to energy security and climate change, they garnered significant support. If the measures were described simply as a gasoline tax, only 12 percent of respondents supported the action and 85 percent opposed it. A February 2006 Resource Media poll confirmed these results, indicating that 58 percent of Californians support a gasoline tax increase to reduce oil consumption and promote alternative fuels.

⁵² Council on Foreign Relations. *National Security Consequences of U.S. Oil Dependency*. October 12, 2006, p. 36.

⁵³ *Ibid.*

⁵⁴ *Ibid.*

⁵⁵ Gross, Daniel. “Raise Gasoline Taxes? Funny, It Doesn’t Sound Republican.” *The New York Times*. October 8, 2006.

⁵⁶ *Ibid.*



Summary: Market-Based Energy Security Tax Relief and Realignment Program

Proposed Action	Implement a California Foreign Oil Security fee if retail prices of petroleum fuels drop below an initial price floor of the average price of fuel over the six months prior to implementation or \$2 per gallon, whichever is greater. This price floor would increase by 1 cent per month for ten years to a maximum level of \$1.20 per gallon above the initial price floor, while each step of the way returning all collected funds to all California taxpayers through a rebate.
Objectives	Significantly spur the use of efficient technologies in vehicles while providing financial rewards to those who use alternative fuels and modes of transportation
Outcome in 2020	As an aggregate, new vehicles sold in 2017 are 15 percent more efficient than business as usual
Projected Annual Petroleum and GHG Reductions	2.9 BGGE of petroleum and 29 million tons of GHGs per year beginning in 2020 ⁵⁷
Estimated Annual Cost	Overall revenue neutrality to the state; undetermined costs associated with the establishment of a cap-and-trade system
Implementation Plan or Proposed Authority	CEC, California Franchise Tax Board
Responsible/Affected Parties	Workers, motorists
Proper Avenue of Enactment	Legislation

⁵⁷ This calculation assumes a price floor for petroleum that is \$1.20/gallon above unadjusted retail price levels beginning in 2020 and a corresponding short-term petroleum demand elasticity of -0.25, which approximates figures cited by Kayser (Gasoline Demand and Car Choice: Estimating Gasoline Demand Using Household Information, 2000) and others as typical short-term petroleum demand elasticity. Even greater petroleum and GHG reductions for ESTRR could be predicted over time: Espey (Gasoline Demand Revisited: An International Meta-Analysis of Elasticities, 1998) surveyed 42 studies and found the average long-term consumer gasoline demand elasticity to be -0.6.



Smart Communities Program

Unfortunately, the implementation of policies that significantly increase the use of alternative fuels and efficient vehicles alone can't enable California to secure its transportation energy future. The problem comes down to the fact that people are driving at ever-increasing levels: vehicle miles traveled (VMT) in the state increased by 162 percent between 1970 and 2000.⁵⁸ This compares with a national increase of 79 percent between 1982 and today.⁵⁹ This increase in the amount of driving, which is caused by the fact that places where people need to go are increasingly farther away from where they live, effectively negates petroleum savings due to any vehicular efficiency gains and compounds excessive petroleum consumption.

Furthermore, congestion costs people and businesses approximately \$17 billion per year and results in more than 665 million gallons of wasted fuel annually.⁶⁰ Californians spend more than 1 billion hours in traffic per year, and the commercial cost of congestion is over \$70 per hour.⁶¹ If unaddressed, the problem will become worse as the state population grows from 35 million today to between 44 million and 48 million people in 2025.⁶²

Communities Embrace Smart Growth, Reduce Oil Consumption and Climate Change Impacts

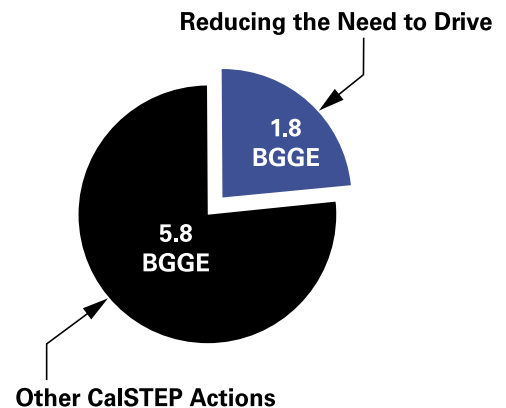
"Smart growth" refers to a set of transportation and land-use policy tools that allow people to live closer to where they work, close to mass transit and other car-free travel options, and in the center of towns and cities, thereby reducing sprawl and congestion and preserving the natural environment. Smart growth is not about stopping growth, but about directing and

managing growth so that people have options regarding where to live and how to travel.

Smart growth can lead communities and cities away from oil dependence. Because land use is a primary determinant of personal transportation energy demand, the widespread utilization of smart growth can reduce travel by 50 percent or more.⁶³ In fact, according to the Natural Resources Defense Council, smart growth has the potential to offset 10 million tons of CO₂ emissions annually and 60,000 barrels per day of oil, and save motorists \$200 billion over ten years.⁶⁴

Recent reports corroborate these assertions by indicating that if practiced on a larger scale, smart growth can help California significantly reduce its petroleum consumption and GHG emissions. The Center for Clean Air Policy states that if California's Metropolitan Planning Organizations (MPOs) were to adopt land-use planning measures to counter the increase in sprawl, VMT would be reduced by over 75 million per year and fuel cost savings would exceed \$1.5 billion by 2020.⁶⁵ A national study by

CalSTEP's actions to reduce the need to drive would reduce annual petroleum consumption by 1.8 BGGE per year in 2020.



⁵⁸ Stoner, Pat. Local Government Commission. Presented at the CEC Land Use and Energy Workshop, September 22, 2006.

⁵⁹ Kronholz, June. "The Coming Crunch." The Wall Street Journal. October 13, 2006.

⁶⁰ Casey, Rose. Relieving Congestion Through Improved Highway Infrastructure: Plans and Solutions. California Department of Transportation. Presentation given at the Transportation Solutions Summit, September 13-14, 2006.

⁶¹ Ibid.

⁶² Roberts, Terry. Land Use and Energy. Governor's Office of Planning and Research. Presented at the CEC Land Use and Energy Workshop, September 22, 2006.

⁶³ Goldstein, David. Land Use Energy in California. Natural Resources Defense Council. Presented to the CEC Committee Workshop, September 22, 2006.

⁶⁴ Ibid.

⁶⁵ Center for Clean Air Policy. Cost Effective GHG Mitigation Measures for California. January 19, 2006; p. 6.



The Research Institute for Housing America estimated potential public and private savings of up to \$10 billion per year from the types of smart growth measures contained in the MPOs' plans.⁶⁶ A national analysis performed by the American Public Transportation Association indicates that one method alone, transit, can significantly reduce VMT and oil consumption by saving more than 855 million gallons of gasoline per year⁶⁷ and reducing CO₂ emissions by more than 7.4 million tons each year.⁶⁸

Various communities in the United States have already implemented smart growth policies and are reaping the associated benefits. In California, three examples include Windsor, Oakland, and San Mateo. Parts or all of these cities have integrated such features as intermodal centers to provide quick and easy access to transit and carpools, a bike station for convenient bicycle parking or service, a focus on pedestrian activity, mixed-use development, proximity to current or future subway or rail lines, and public space for community activities. Implementing these features improved the welfare of the communities' residents and, accordingly, the demand to live in such areas.

The community of North Beach in San Francisco, with its high-density housing and convenient access to transit, is a smart growth community that allows for driving to be optional. This has led to a 75 percent reduction in per-capita vehicular miles traveled, as well as the associated petroleum consumption, compared with a typical sprawl community such as San Ramon.⁶⁹

Other communities across the nation are pursuing smart growth and reducing VMT as well. Atlantic Station in Atlanta, Georgia, recognized as much as

a 50 percent reduction in the need for automobile use through the use of smart growth practices.⁷⁰ Portland, Oregon, absorbed a 26 percent growth in population from the mid-1980s to the mid-1990s with only a 2 percent growth in traffic. Energy consumption per capita in Portland dropped 8 percent.⁷¹ Portland residents now have shorter average commute times and cleaner air.⁷²

In 1997, Maryland passed its seminal Priority Funding Areas Act along with four complementary components that, as a whole, direct the state to target programs and funding to support established communities and locally designated growth areas, dubbed priority funding areas, and to protect rural areas that fall outside the priority areas. Maryland laid the groundwork for this law in 1992 when it passed the Economic Growth, Resource Protection, and Planning Act, which articulated the state's growth policy through seven visions centered around concentrating development in suitable areas, protecting sensitive areas, and establishing funding mechanisms to achieve the visions. The 1992 Act also required local jurisdictions to address these same visions in their comprehensive plans. Maryland now has more than 80 programs that help further smart growth.⁷³

To achieve the goal of reducing Californians' need to drive, CalSTEP recommends that the state upgrade its transportation models, use VMT as the metric for measuring the energy efficiency and petroleum/GHG-reducing success of smart growth implementation, and adopt a goal of reducing VMT by at least 10 percent over approximately twenty-five years. These actions would be integrated into a Smart Commu-

⁶⁶ Research Institute for Housing America. *Linking Vision with Capital—Challenges and Opportunities in Financing Smart Growth*. 2001. [Online] <http://www.housingamerica.org/docs/RIHA01-01.pdf>.

⁶⁷ Shapiro, Robert, et al. *Conserving Energy and Preserving the Environment: The Role of Public Transportation*. American Public Transportation Association. July 2002: p. 18

⁶⁸ *Ibid.* p. 5

⁶⁹ Holtzclaw, John. *A Vision of Energy Efficiency*. The Sierra Club. Presented at the 2004 ACEEE Summer Study on Energy Efficiency in Buildings. Pacific Grove, CA. August 22–27 2004.

⁷⁰ Lovaas, Deron. *Smart Growth and Climate Change*. PowerPoint presentation. [Online] [http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/ADIM5GZQZG/\\$File/09_Deron_Lovaas.pdf](http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/ADIM5GZQZG/$File/09_Deron_Lovaas.pdf)

⁷¹ Nelson, Arthur C. "Effects of Urban Containment on Housing Prices and Landowner Behavior," *Land Lines*, Lincoln Institute of Land Policy, May 2000: p. 3.

⁷² Natural Resources Defense Council. *Reducing Oil Dependence*. [Online] <http://www.nrdc.org/air/energy/fensec.asp>

⁷³ Maryland Department of Planning. *Smart Growth Background*. [Online] <http://www.mdp.state.md.us/smartintro.htm>



nities program that links new financial incentives for transportation and infrastructure development to the establishment and accomplishment of these recommendations. Such a program would create incentives for the inclusion of overarching transportation energy criteria to link the interactions among government regulation, incentives, market forces, and policies at the local, regional, state, and national levels; all these factors contribute to the complexity of California's current development decision-making process, which leads to sprawl.

Upgrade Transportation Models

The state's first required action is to upgrade its transportation models so the cost savings associated with smart growth can be fully realized. Without such action, the state will continue to base highway construction projects on transportation models that are blind to many of smart growth's benefits and therefore fail on a fundamental level to provide incentives for it. To remedy this problem, CalSTEP believes an approach needs to be taken similar to the one proposed by Assemblymember Loni Hancock during the 2006 California legislative session, in a bill that was passed by the legislature but vetoed by the governor.⁷⁴ This approach would:

- Require Caltrans to work with MPOs and countywide Regional Transportation Planning Agencies (RTPAs) to update transportation models to take into account land-use intensity, access to transit, alternate transportation modes, and other factors.
- Require Caltrans to determine and provide notice to the legislature of a schedule for review and evaluation of current models and model improvements already under way.
- Require Caltrans to meet at least annually with MPOs and RTPAs to evaluate progress and identify resources to help agencies meet the requirements of the bill.

- Consider the upgraded models used by RTPAs and MPOs to be state-of-the-practice and fully adequate technically.

Upgrading California's transportation models is an essential first step, but a more comprehensive approach that links new state funding to VMT reduction needs to be pursued concurrently.

Link New State Funding to VMT Reduction

The heart of the Smart Communities program links all new state and, to the greatest extent possible, federal transportation and infrastructure funding to the creation and implementation of criteria that ensure that this new funding will actively reduce regional VMT, petroleum consumption, and GHG emissions, with the added requirement that it avoids supporting sprawl.

Smart Communities would accomplish this task through two requirements: Council of Governments (COGs) to include various provisions in regional blueprints and MPOs to modify general plans to ensure that the regional blueprints are implemented.

Regional blueprints, such as the one adopted by the Sacramento Area COG in December 2005, are comprehensive documents that outline preferred scenarios for population growth, incorporating issues such as land use, water consumption, jobs per household, and VMT. The first aspect of the Smart Communities program establishes that the distribution and distribution priority of all transportation and development-related funds by the California Transportation Commission to the various COGs are based at least in part on regional blueprints that contain the following provisions:

- VMT reduction of 10 percent, or the greatest feasible amount;
- Planning principles that encourage development where urban services already exist and that increase the transportation energy efficiency of new development;

⁷⁴ AB 1020, Hancock



- The identification of housing locations for all the expected net migration into the region, population growth, household formation, and employment growth; and
- The existence of Development Opportunity Zones that, much like Maryland's Priority Funding Areas, would encourage development to follow the preferred development scenario within the regional blueprint. These zones would safeguard significant farmlands and habitats from development unless it is infeasible to exclude those lands and the regional blueprint sets forth strategies that would fully mitigate their loss.

The second aspect of the Smart Communities program predicated the distribution of funds by COGs, which lack the authority to authorize land use, to MPOs that are implementing the respective regional blueprints, as indicated by their incorporation into an MPO's general plan.⁷⁵ Currently, every city and county must adopt general plans, which are long-range policy documents that guide all land-use decisions related to physical development in a community. While there are seven mandatory elements in any general plan, energy consumption is not one of them. In fact, only about 10 percent of general plans currently include an energy element.⁷⁶ Predicating the distribution of new funding on the adoption and implementation of general plans that reflect the regional blueprints' focus on a 10 percent VMT reduction will solve this problem.

In all cases, funding priority should be ranked and rated based on criteria including the expected level of VMT reduction. The Department of Business, Transportation, and Housing should be in charge of these rankings and could issue a yearly "grade" for communities tracking their progress; the California Transportation Commission should be in charge of distributing money to COGs; and COGs should disperse money to local MPOs based on the aforementioned criteria.

Like other CalSTEP programs, Smart Communities is inherently flexible. The focus of the program is VMT reduction, but it allows regions to determine their preferred method. In order to facilitate the provision of multiple tools to achieve these objectives, CalSTEP proposes Neighborhood Planning Revolving Loan and Transit Use Assistance programs that provide assistance to communities choosing to reduce VMT. These programs are discussed in the Supporting Actions section.

CEQA Assistance with Smart Growth Implementation

Finally, the California Environmental Quality Act (CEQA) should provide assistance with smart growth development and VMT reduction. CEQA's role in identifying and mitigating physical impacts on the environment already allows for EIRs to take place on the programmatic level, thereby subjecting projects to review on only project-specific impacts. However, CEQA can assist smart growth implementation even further by focusing on three targeted areas.

1. The master environmental impact review process should be made specifically applicable to regional blueprints and local neighborhood planning efforts that implement regional blueprints.
2. The urban infill exemption contained in CEQA should be limited to infill that is in alignment with VMT-reducing regional blueprints, and should apply only to local governments that adopt local plans implementing regional blueprints that meet state VMT-reduction goals.
3. CEQA should permit macro-level traffic mitigation policies for development projects within areas whose local governments adopt local plans that implement VMT-reducing regional blueprints. Projects that are consistent with a local jurisdiction's general plan implementing the regional blueprint's preferred development scenario and that comply with these mitigation policies would

⁷⁵ In the case of the San Francisco Bay Area, blueprints would be adopted by both the San Francisco Bay Area Metropolitan Transportation Commission and the Association of Bay Area Governments (ABAG).

⁷⁶ Some plans that include energy elements are the Monterey Bay Regional Energy Plan (2006), Shasta County General Plan, Energy Element (2004), and the City of Indio, Stetson Hills Energy Alternatives Analysis (2000).



not be required to provide additional project-specific traffic mitigation. Under this proposal, local communities would not lose autonomy because if they don't agree with the regional blueprint, they don't have to adopt it. This process is all voluntary, and it is driven by the desire to spend federal and state dollars in the most

effective way possible. Ideally, though, the regional blueprints would reflect the interests of the local agencies that make up the COG that is preparing the blueprint. Thus, federal and state dollars would be used to meet transportation needs that assist local governments with the implementation of their local plans.

Summary: Smart Communities Program

Proposed Action	<ul style="list-style-type: none"> · Provide new state transportation funding to local governments that will implement regional blueprints that reduce VMT by 10 percent over the next twenty-five years. · Upgrade California's transportation models so the cost savings associated with smart growth can be fully realized. · Use CEQA to encourage local smart growth planning, VMT reduction, and development consistent with regional blueprints.
Objective	Reduce VMT by at least 10 percent over approximately twenty-five years
Outcome in 2020	VMT reduction of 10 percent
Projected Annual Petroleum and GHG Reductions	1.8 BGGE of petroleum and 18 million tons of GHGs in 2020
Estimated Annual Cost	Variable; determined by new state and federal spending on transportation
Implementation Plan or Proposed Authority	California Transportation Commission; California Department of Transportation; Department of Business, Transportation, and Housing
Responsible/Affected Parties	COGs, MPOs, developers
Proper Avenue of Enactment	Legislation

Supporting Actions

DETAILED DESCRIPTIONS AND SUPPORTING DATA





While the primary actions may be sufficient to achieve the overall CalSTEP goals on their own, the supporting actions that follow complement them and further enable progress while leading to additional statewide benefits and reducing statewide petroleum consumption, even if they are pursued independently.

California Alternative Fuels Infrastructure Partnership

California is caught in a “chicken or egg” dilemma when it comes to alternative fuels. Stations need to be built but retailers are hesitant to invest in these stations because the stations will rarely be used without a sufficient AFV population. The ARB tried to solve this problem when it implemented its Clean Fuels program,⁷⁷ which authorized it to require fuel providers to offer various alternative fuels once a fuel’s California vehicle population reached 20,000. Yet the regulation has not been exercised.

Solving the “Chicken or Egg” Dilemma

The California Alternative Fuels Infrastructure Partnership solves the “chicken or egg” problem by linking alternative fuel infrastructure financial incentives to the population of the fuels’ associated vehicles in the state. It acknowledges that the state should play a role in financially supporting the roll-out of alternative fuel stations and recognizes that such an investment will only be effective if automobile manufacturers and station owners commit to action in return.

Accordingly, under this program infrastructure support would be contingent upon vehicle population growth, thereby ensuring that AFVs won’t be introduced without infrastructure development. This approach spreads the responsibility for alternative fuel development among the state, automakers, and fuel retailers.

1,800 Alternative Fuel Stations and 11 Million AFVs in 2020

The program would provide a state grant that averages \$50,000 for a specific alternative fuel’s infrastructure development when every 6,000 vehicles, on average, that can run on that fuel are sold in the state, with a cap in total funding of \$9 million per year over ten years. The goal is to establish a sufficient quantity of alternative fuel stations and

⁷⁷ CCR Title 13, Div 3, Ch 5, SubCh 8, Sections 2303 and 2303.5.



vehicles by 2020 to make a tangible difference in petroleum reduction and help establish a business case that prompts fuel retailers to continue adopting alternative fuels even after the subsidies run out. These incentives would be in addition to existing federal tax credits for alternative fuels.⁷⁸ If fully exercised, the CalSTEP Alternative Fuels Infrastructure Partnership would help establish 1,800 alternative fuel stations supporting over 11 million AFVs in 2020, creating a market size that would help justify the addition of alternative fuel stations by retailers beyond the supported 1,800. The CEC, based on work performed by the Oak Ridge National Laboratory,⁷⁹ has estimated that 1,800 stations, which is equivalent to a 20 percent penetration rate, is the nominal level needed to support the use of and create ongoing concern for alternative fuels.

The program would provide substantial incentives for station operators to offer alternative fuels. And rather than having government decide where to build stations, fuel providers would be able to make independent business decisions based on Department of Motor Vehicle registration records or other market-based scenarios, thereby ensuring that alternative fuel stations are surrounded by sufficient vehicle populations and used accordingly.

Fuels that qualify for grants under this program would include those that meet the ARB's specifications for an alternative fuel and that require new infrastructure fundamentally different from the state's existing gasoline and diesel infrastructure, with an associated incremental cost of adoption. Such examples of eligible fuels include, but are not limited to, E85 ethanol, compressed natural gas, liquefied petroleum gas, hydrogen, and electricity. The AFVs that qualify under this program should meet the ARB's gasoline emissions standards.

Early Adoption Incentives and Other Details

Early adoption can be made attractive by front-loading the program for alternative fuel stations, as follows:

- First 450 stations: \$75,000 per station
- Second 450 stations: \$55,000 per station
- Third 450 stations: \$40,000 per station
- Fourth 450 stations: \$30,000 per station

The vehicle production incentive can be front-loaded as well, as follows:

- First 2.8 million vehicles: one fueling station grant for every 3,000 vehicles running on a specific alternative fuel sold in the state
- Next 5.6 million vehicles: one grant for every 6,000 vehicles sold
- Final 2.8 million vehicles: one grant for every 9,000 vehicles sold

Fleet operators and other parties responsible for purchasing and constructing alternative fuel infrastructure would be eligible for grants under the AFPS if the constructed stations are publicly accessible.

Grants would be distributed on a competitive basis, and applications from station providers in areas with the largest AFV populations would be given priority. For applications from providers in areas with equal AFV populations, the granting process would defer to first come, first served.

⁷⁸ In the case of E85, 30 percent of station conversion costs up to \$30,000 are covered by federal tax credits.



Summary: California Alternative Fuels Infrastructure Partnership

Proposed Action	Link state spending of up to \$9 million per year for alternative fuel infrastructure directly to the growth of the AFV population
Objectives	Spur the growth of viable alternatives to petroleum vehicles and infrastructure by 2020
Outcome in 2020	The establishment of an additional 1,800 alternative fuel stations; one-third of the California vehicle fleet is alternative fuel capable
Projected Annual BGGE and GHG Reductions	1.0 BGGE of petroleum and 5 million tons of GHGs if enacted alone (intended to support the Alternative Fuels Portfolio Standard total)
Estimated Annual Cost	\$9 million per year for ten years
Implementation Plan or Proposed Authority	CEC
Responsible/Affected Parties	Fuel retailers will apply for and receive the grants; the CEC will distribute them
Proper Avenue of Enactment	Legislation

California Renewable Fuel Production Initiative

In April 2006, Governor Schwarzenegger passed Executive Order S-06-06, which, among other things, sets goals and targets for the state to produce at least 40 percent of the renewable fuel it consumes by 2020. While this executive order admirably set effective targets for in-state production, it does not require the consumption of in-state feedstocks to produce this renewable fuel, nor does it propose tactics for overcoming barriers to in-state feedstock utilization, thereby forgoing even greater economic benefit, waste disposal opportunities, and leadership status.

CalSTEP believes that for the state to truly benefit from the greater use of renewable fuels, California must directly translate, where feasible, its growing consumption of such fuels into economic growth. By targeting two investments totaling \$40 million over five years, the state can help spur the creation of an

advanced renewable fuel production industry in California and achieve economic rewards similar to those demonstrated by renewable fuel production in other states and outlined in various California studies.

Precedent for State-Level Renewable Fuel Production and Economic Growth

In the United States, Minnesota is the state with the most aggressive renewable fuel production platform. Created in response to the state's desire to capitalize on and expand its agricultural economy and address air-quality problems in the Twin Cities, the Minnesota Ethanol Program consists of an ethanol producer incentive to encourage in-state production as well as an ethanol-in-gasoline blending requirement.

The ethanol plants this program created are expanding Minnesota's economy by spending more of their money on in-state raw materials and by keeping more of their profits and dividends inside the state.⁸⁰ Today, the Minnesota Department of Agriculture reports that for every \$1 spent in pro-



ducer incentive payments, the state received \$16 to \$20 in economic impact.⁸¹ Overall, Minnesota's drive to greater use of renewable fuel led to the creation of 16 ethanol plants that produce 550 million gallons each year, \$587 million in output, 2,562 jobs, and over \$1.3 billion in net annual benefit to the state.⁸² The Minnesota Ethanol Program was stunningly successful in developing the state renewable fuel industry, so much so that as of 2001, the state has not only been able to meet its ethanol needs, but has also become a net exporter of the fuel.

Similar recently enacted biodiesel programs are prompting Minnesota to become the first state to utilize biodiesel fuel on a broad scale, and, as with ethanol, these programs are leading the state to produce more fuel as well. In fact, the state went from virtually no production in 2004 to a biodiesel production capacity of over 60 million gallons per year in 2005.⁸³ The state's biodiesel program not only will help reduce oil consumption, but the Minnesota Department of Agriculture estimates that it will also lead to \$206 million to \$515 million in total statewide economic impacts and create 973 to 2,431 new jobs.⁸⁴

Missouri believes it can follow the same path as Minnesota. Bills recently passed by the state's legislature lead the Missouri Corn Growers Association to expect ethanol production in the state to reach at least 350 million gallons by 2008, surpassing the 280-million gallon market that would be created by the Renewable Fuels Commission and allowing the state to become a net ethanol exporter.⁸⁵

In October 2006, Michigan Governor Jennifer M. Granholm announced the formation of the Michi-

gan Renewable Fuels Commission to promote similar renewable fuel production and use policies. This commission was established under Public Act 272 of 2006, which, in addition to creating the commission, allowed for the creation of new agriculture renaissance zones to help spur additional ethanol and biodiesel plants, among other things.⁸⁶

Transportation Energy from California Feedstocks

California has been the nation's leading agricultural state for over fifty years.⁸⁷ The California Department of Food and Agriculture reports that California's agricultural producers received \$31.8 billion for their products in 2004.⁸⁸ By including renewable fuels in the state's fuel diversification strategy, the CEC believes that California can add several billion dollars to this figure over the next decade while creating thousands of new jobs.

California's renewable fuel production potential isn't identical to Minnesota's. For starters, corn is a smaller commodity in California. According to the U.S. Department of Agriculture, California planted about 540,000 all-purpose acres of corn for grain in 2005 compared with 7.3 million planted acres in Minnesota.⁸⁹ "Grains, oilseeds, dry beans, and dry peas," a category that encompasses corn, represented 2.8 percent of California's 2002 market value of agricultural products sold, compared with 41.4 percent in Minnesota. In fact, corn alone represents approximately 25 percent of Minnesota's total market value of agricultural products sold.⁹⁰

Instead, the CEC and other organizations have identified other feedstocks for producing renewable

⁸¹ Groschen, Ralph. And Minnesota Department of Agriculture. *Economic Impact of the Ethanol Industry in Minnesota*. May 2003; p. 13.

⁸² Minnesota Department of Agriculture. [Online] <http://www.mda.state.mn.us/ethanol/default.htm>

⁸³ Oregon Environmental Council. *Minnesota's Biofuels Programs: Economic and Environmental Impacts*. February 2005; p. 4.

⁸⁴ Ye, Su. *Economic Impact of Soy Diesel in Minnesota*. Minnesota Department of Agriculture. July 2004; p. 4.

⁸⁵ Missouri Corn Growers Association. "House Passes Statewide Ethanol Standard." April 6, 2006. [Online] <http://www.mocorn.org/news/2006/NewsRelease-040606House.htm>

⁸⁶ Office of the Governor. "Governor Granholm Makes Appointments to Newly Created Michigan Renewable Fuels Commission." October 11, 2006. [Online] <http://www.michigan.gov/gov/0,1607,7-168--153361--,00.html>

⁸⁷ California Farm Bureau Federation.

⁸⁸ California Department of Food and Agriculture. *California Agricultural Resource Directory 2005*.

⁸⁹ United States Department of Agriculture. National Agricultural Statistics Service. [Online] http://www.nass.usda.gov/Statistics_by_State/

⁹⁰ Ibid.



fuels inside California. Although starch and sugar crops are in the mix, the greater potential is from sources such as cellulosic ethanol and Fischer Tropsch liquids, also known as biomass-to-liquids (BTL), that produce diesel from gasified biomass. Biomethane from manure, rice straw, and other agricultural sources may also play a role. These production technologies rely on cellulose in crop waste and purpose-grown biomass, such as grasses and short-rotation trees, rather than starch and sugar crops and aren't limited by competition with feed, fiber, and food crops. These emerging systems are where California has the largest potential for renewable fuel production and economic growth. Cellulosic ethanol and BTL also have among the lowest life-cycle GHG emissions of liquid biofuels. The CEC states that "at an average yield of 70 gallons per ton, California's cellulosic resources could potentially support a production level of 1.5 billion gallons of ethanol in the state," a level that would require "3 million acres, or somewhat more than a third of total irrigated agricultural acres in the state," to produce from corn grain alone.⁹¹ That production number could approach 3 billion gallons by 2020.⁹² California produces 80 million dry tons of biomass residues each year, with about 32 million dry tons per year that are sustainably accessible for conversion into vehicle fuel.

Furthermore, as in Minnesota, the utilization of California feedstocks for renewable fuel production can promote economic growth. The CEC's PIER Collaborative Report, titled *Biomass in California*, states:

"Biomass utilization leads to primary jobs creation in collection, construction, and facility operations, and secondary jobs through local and regional economic impacts. These jobs would be created in both rural and urban areas as greater use is made of all types of biomass in the state."⁹³ Another CEC report⁹⁴ looked only at the creation of a biomass-to-ethanol industry in California and estimated that, at 2005 consumption levels, such an industry would create approximately 8,000 jobs.⁹⁵ The same report also estimated statewide economic benefits of \$5 billion over a twenty-year period at 2005 consumption levels.⁹⁶

Unfortunately, cellulosic ethanol and BTL are not yet commercially feasible. For cellulosic ethanol, the price and quantity of the cellulose enzymes required to turn cellulosic material into sugar are still excessive.⁹⁷ For BTL, while longer-term prospects indicate that this process can be cost-effective if oil remains above \$50 per barrel,⁹⁸ the Fischer Tropsch process is currently about 75 percent more expensive than the production of crude oil.⁹⁹ California can help remedy this problem by aligning incentives toward the eventual commercialization of these technologies. The larger production potential for these fuels and the lower GHG impact, compared with conventional ethanol and biodiesel mean that the state can reap even larger economic gains by cultivating the industry's presence in California. California's pioneering efforts along these lines could make us a leader, and allow us, like Minnesota, to export both the technology and the biofuels for economic gain.

⁹¹ CEC. *Biomass in California: Challenges, Opportunities, and Potentials for Sustainable Management and Development*. CEC-500-2005-160. June 2005; p. 45.

⁹² Germain, Richard, and Katofsky, Ryan. *Recommendations for a Bioenergy Plan for California*. California Bioenergy Interagency Working Group. April 2006. p. 18.

⁹³ CEC. *Biomass in California: Challenges, Opportunities, and Potentials for Sustainable Management and Development*. CEC-500-2005-160. June 2005; p. xiii.

⁹⁴ CEC. *Costs and Benefits of a Biomass-to-Ethanol Production Industry in California*. P500-01-002. March 2001.

⁹⁵ *Ibid.* p. 54. The report estimated 250 ethanol plant positions and 1,350 biomass collection and hauling jobs per 200 million gallons of annual production. The 2005 California consumption level was approximately 1 billion gallons.

⁹⁶ *Ibid.* p. x.

⁹⁷ Still, costs have been reduced to less than 10 percent of the previous amount through aggressive research. See http://www1.eere.energy.gov/biomass/pdfs/genencor_esp_review.pdf

⁹⁸ Tijmensen, M.J.A., et al. "Exploration of the possibilities for production of Fischer Tropsch liquids and power via biomass gasification." *Biomass and Bioenergy* 23:129-152. 2002.

⁹⁹ CEC. *Biomass in California: Challenges, Opportunities, and Potentials for Sustainable Management and Development*. CEC-500-2005-160. June 2005; p. 47.



Two Targeted Investments in Home-Grown Renewable Fuels

The California Renewable Fuel Production Initiative would create two targeted investment funds focused on overcoming key obstacles to the creation of an advanced renewable fuel production industry in California.

First, in current major renewable fuel-producing states such as Minnesota and Iowa, there is significant activity by the state's universities and other research organizations focused on feedstock production and distribution. California has no activity at a comparable level. Consequently, CalSTEP believes that the state should create and the CEC (in consultation with the Department of Food and Agriculture and the Integrated Waste

Management Board) should administer a series of competitive research and outreach grants of \$4 million per year for five years focused on priority areas and objectives that overcome the key barriers to sustainable California renewable transportation fuel production from crops and waste sources.

These barriers are identified in the CEC's Roadmap for the Development of Biomass in California. Created in response to the previously mentioned executive order issued by the governor, the report lists priority areas based on a thorough and integrated examination of barriers to renewable fuel production in California. Through this work, the collaborative identified recommended actions in a variety of priority areas.

California Biomass Collaborative Roadmap Priority Areas and Objectives

Priority Area	Objectives
Resource access, feedstock markets, and supply	Overcome logistical and practical barriers related to feedstock suppliers' access to renewable fuel resources, the sustainable and affordable delivery of feedstock into renewable fuel markets, and the harmonization of renewable fuel production with sustainable land-use practices
Market expansion, access, and technology deployment	Address issues concerning biorefineries' access to biomass feedstock supplies and product markets, and market barriers related to the physical capacity to competitively deliver finished product.
Research, development, and demonstration	Research, develop, and demonstrate potential conventional and advanced California biofuel feedstocks (crops and waste sources) and technologies
Education, training, and outreach	Disseminate research and results to and stimulate dialogue between state farmers, biomass collectors, fuel producers, distributors, and other key stakeholders
Policy, regulations, and statutes	Develop and implement comprehensive state-level policies, regulations, and statutes that allow for effective innovation and lead to the fulfillment of the state's long-term potential

Source: California Energy Commission¹⁰⁰

¹⁰⁰ CEC California Biomass Collaborative. A Roadmap for the Development of Biomass in California. CEC-500-01-016. September 2006.



Second, CalSTEP believes that the state should mirror a program initiated by New York Governor George Pataki that seeks to jump-start advanced renewable fuel production from in-state resources. This program provides up to \$20 million to as many as four applicants or teams of applicants that successfully demonstrate the technical, financial, business, and organizational capability to construct a pilot-scale enzymatic-hydrolysis, gasification ligno-cellulose-to-ethanol, or BTL facility that utilizes in-state plants or materials (including waste materials). Recipients must use the information derived from their facilities' operation to develop commercial-scale production facilities. The outcome for California would be the construction of a facility capable of producing transportation-grade renewable fuels from biomass feedstocks in California within two years and the operation of the facility for a minimum of three years.

The program would have six goals:

1. The development of at least one (preferably more) commercial-scale cellulosic ethanol and/or BTL production facility in California;
2. The promotion of enzymatic-hydrolysis and/or syngas (gasification) technologies rather than older acid hydrolysis methods;
3. Encouraging the emergence of other innovative methods and fuels that we may not yet be aware of;
4. The creation of jobs and economic activity from the production of advanced renewable fuels;
5. The development of cellulosic ethanol and/or BTL feedstocks grown or produced in California, with resulting jobs and economic activity in the agricultural and/or forestry industries, plus increased productivity and utilization of California agricultural and/or forest lands while ensuring thoughtful and sustainable land-use practices; and
6. The commercialization of other technologies developed at California colleges, universities, and/or businesses based in the state.

Administered by the CEC in coordination with the California Department of Food and Agriculture and the Integrated Waste Management Board, such a California-based program would harness the state's ability to overcome first-mover risks associated with early advanced renewable fuel production from in-state feedstocks and solve early production problems and logistics. As countless investment banks and venture capitalists will attest, demonstration of the real-world viability of advanced renewable fuel production methods is critical if the state is to expect large-scale participation by the investment community. Clearly, demonstrating viability would help pave the way for adoption of larger capacity and scaled advanced renewable fuel production and achieving their associated economic benefits.

Finally, CalSTEP also believes that the use of in-state feedstocks from underutilized land or waste resources should be prioritized. Reuse of materials such as manure, rice straw, cotton gin waste, and municipal solid waste can reduce their environmental impacts. Crops cultivated as winter cover crops or under dryland conditions, or crops that improve soil, water, or air quality should be a priority over the use of other crops for energy production. Accordingly, as the previously outlined questions are answered and California develops more clarity on how to produce and distribute the renewable fuels it produces, CalSTEP advocates providing financial incentives to those who produce and/or purchase more sustainable feedstocks. One such option is a production tax credit or even abatement for biofuel growers or biorefinery operators on the portion of the fuel they produce from preferred feedstocks, providing a significant incentive for their use and effective land and resource management in the state.



Summary: California Renewable Fuel Production Initiative

Proposed Action	\$4 million per year for five years in renewable fuels research and outreach grants and \$20 million in grants focused on the development of an advanced renewable fuel production industry in California
Objectives	Link California's increasing biofuel consumption with state-level economic growth and help commercialize advanced biofuel production in a faster time frame
Outcome in 2020	A vibrant in-state conventional and advanced renewable fuel production industry
Projected Annual Petroleum and GHG Reductions	Reinforce and build political and economic support for other CalSTEP-endorsed actions, including the Alternative Fuels Portfolio Standard
Estimated Total Cost	\$40 million over five years
Implementation Plan or Proposed Authority	California Energy Commission in consultation with the Department of Food and Agriculture and the Integrated Waste Management Board
Responsible/Affected Parties	Universities, nongovernmental organizations, fuel producers, investment community
Proper Avenue of Enactment	Legislation

State Fleet Leadership Challenge

As of 2003, state agencies, which include the University of California campuses and state universities, operated nearly 73,000 vehicles that used approximately 46 million gallons of gasoline and 9 million gallons of diesel fuel per year.¹⁰¹ By reducing this consumption 20 percent by 2020, the state can set an example for its 2020 transportation energy goals, save money, educate the public, develop creative methods for reducing petroleum consumption, and help expand the market for efficient and AFVs.

Living Up to the Spirit of the Energy Policy Act

The Energy Policy Act of 1992 requires AFVs to account for at least 75 percent of various state government fleets' annual new light-duty vehicle acquisitions.¹⁰² In this regard, California is going beyond its

obligations. As **Table 4 (see page 54)** indicates, the state purchased 4,799 vehicles, of which 75 percent (1,124) were subject to the Energy Policy Act requirements in fiscal year 2001–2002. California surpassed this number by procuring 82 percent (925) of its Energy Policy Act–qualifying vehicles as AFVs.¹⁰³

¹⁰¹ California State Vehicle Fleet Fuel Efficiency Report: Volume II. Prepared by TIAX LLC for the CEC, Air Resources Board, and Department of General Services. 600-03-004. April 2003.

¹⁰² U.S. Department of Energy, Energy Efficiency and Renewable Energy. Energy Policy Act. [Online] <http://www.eere.energy.gov/vehiclesandfuels/epact/state/index.shtml>

¹⁰³ California State Vehicle Fleet Fuel Efficiency Report, Volume I. Prepared by TIAX LLC for the CEC, Air Resources Board, and Department of General Services. 600-03-003. July 2003.



Table 4: Fiscal Year 2001-2002 State Vehicle Purchases

Vehicles Subject to EPAct Fleet Rules	Number of Vehicles Purchased
Light duty sedans	67
Trucks and vans	19
Hybrid-electric vehicles	113
Alternative fuel vehicles	925
Subtotal	1,124

Vehicles Exempt from EPAct Fleet Rules	Number of Vehicles Purchased
Law Enforcement pursuit and Undercover vehicles	1,362
Light, medium and heavy duty trucks	648
Emergency Vehicles and Fire Trucks	116
Vans, buses, and heavy equipment	616
Others (Boats, motorcycles, SUVs, etc.)	933
Subtotal	3,675

Total Vehicles	4,799
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Source: DGS FY 2001/2002 Fleet Purchase Document

Table 5: Estimated Breakdown of the State Fleet by Technology and Fuel Use

Vehicle Type	Primary Fuel Used (w/ Frequency)	Number of Vehicles	Percent of Total Fleet
Conventional Light- and Medium-Duty Vehicles (including Motorcycles)	100% Gasoline	62,091*	85.8%
Light-Duty AFVs with Bi-, or Flex-Fuel Capability	98.8% Gasoline ^{vii}	5,221	7.2%
Conventional Heavy-Duty Vehicles	100% Diesel	4,400*	6.1%
Light-Duty Dedicated AFVs	100% CNG	288	0.4%
Light-Duty Hybrid Electric Vehicles	100% Gasoline	220 ^{vii}	0.3%
Light-Duty Battery EVs	100% Electricity	149	0.2%
Totals		72,369	100%

Source: Information provided by the Department of Motor Vehicles and the DGS Office of Fleet Administration.

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*Rough estimates: data were unavailable to accurately estimate breakout of gasoline-versus diesel-fueled vehicles.

On the surface, the state's procurement habits seem impressive, especially once one considers that, in addition to its 83 percent AFV procurement rate for vehicles that fall under the Energy Policy Act requirements, an additional 10 percent of vehicles procured in this category are hybrids, which leaves just 7 percent as conventional vehicles. However, looking deeper into this data, reveals serious shortcomings and missed opportunities.

One shortcoming comes with the procurement of flexible-fuel vehicles (FFVs), which can be fueled with gasoline or ethanol (E85). While these vehicles are technically AFVs because of their ability to operate on ethanol, they are rarely fueled with ethanol. In fact, **Table 5** indicates that of California's 5,200-plus AFVs in the 2002 state fleet, only 1.2 percent (63) were fueled with alternative fuels, leaving the remaining 98.8 percent to be fueled with conventional gasoline.¹⁰⁴ This example illustrates one of many opportunities for the state fleet to reduce its petroleum consumption.

Prescribing the Goal, Not the Methods

Recently signed legislation addresses the state fleet's petroleum consumption by focusing on components that are responsible for that consumption. Most

¹⁰⁴ California State Vehicle Fleet Fuel Efficiency Report: Volume II. Prepared by TIAx LLC for the California Energy Commission, Air Resources Board, and Department of General Services. 600-03-004. April 2003.

¹⁰⁵ AB 2264 Pavley, Chapter 767, Statutes of 2006.



notably AB 2264 establishes a minimum fuel economy standard for the state fleet that applies to the purchase of passenger vehicles and light-duty trucks powered solely by internal combustion engines utilizing fossil fuels.¹⁰⁵ Other states are pursuing similar measures that focus on particular technologies: a Colorado law requires that all state vehicles be fueled with B20 by 2007 if the cost is competitive, and a Maryland law requires that the state ensure that at least 50 percent of vehicles using diesel fuel in the state vehicle fleet use a blend of fuel that is at least B5. The State Fleet Leadership Challenge is different in that it would prescribe an overarching goal rather than focusing on possible methods of achieving that goal.

The program follows the model established by North Carolina, which issued a similar challenge to its fleet in 2005.¹⁰⁶ The North Carolina program orders state fleets to “develop and implement plans to improve use of alternative fuels, synthetic lubricants, and efficient vehicles” so that the plans “achieve a 20 percent reduction or displacement of the current petroleum products consumed by January 1, 2010.”

The advantage of such a goal is that a variety of methods can be utilized to achieve it. The state can meet the target by fuel swapping, blending renewable fuels with petroleum fuels, adopting AFVs, phasing in more fuel-efficient vehicles, or some other yet-to-be-discovered method. By employing this process, state fleets are not only using their formidable purchasing powers¹⁰⁷ to expand markets, which the San Francisco Chronicle described as “compelling volume purchasing power that no automaker can ignore,”¹⁰⁸ but are also actively engaged in the search for creative and cost-effective techniques for reducing petroleum consumption. If North Carolina can employ these methods and achieve this goal by 2010, surely California can do it by 2020.

Furthermore, the state’s expressed demand for vehicles that may not exist—such as significantly more efficient law enforcement and emergency vehicles that

meet the requirements of their users—would help spark innovation and the development of new technologies that can be offered in other platforms and to other users. State demand can assist with the development, implementation, and diffusion of the technologies that will be used in these and other platforms.

Fleet operators and other parties responsible for the purchasing and construction of alternative fuel infrastructure to meet this challenge would be eligible for grants under the California Alternative Fuels Infrastructure Partnership if the constructed alternative fuel stations are publicly accessible. Additional incentives could be allocated if necessary.

By employing this process, state fleets are not only using their formidable purchasing powers to expand markets, but are also actively engaged in the search for creative and cost-effective techniques for reducing petroleum consumption.

¹⁰⁶ Section 19.5(a), SL2005-0276.

¹⁰⁷ Each year, California purchases an average of 5,100 vehicles for its state fleet.

¹⁰⁸ Black, Edwin. “Auto Fleets Could Put U.S. on the Green Highway It’s Going to Take to Leave Gas Behind.” San Francisco Chronicle. October 15, 2006.



Summary: State Fleet Leadership Challenge

Proposed Action	Direct the secretary of state and the Consumer Services Agency to develop and implement a plan to improve the overall state fleet’s use of alternative fuels, synthetic lubricants, and/or efficient vehicles. The plan should achieve a 10 percent reduction or displacement of the current petroleum products consumed by January 1, 2012 and a 20 percent reduction or displacement of the current petroleum products consumed by January 1, 2020, compared with 2003 base levels.
Objectives	<ul style="list-style-type: none"> · Demonstrate state leadership · Account for EPAAct loopholes · Educate the public
Outcome in 2020	State fleet uses 20 percent less petroleum
Projected Annual Petroleum and GHG Reductions	0.01 BGGE of petroleum and 0.1 ton of GHGs in 2020 (primary purpose is leadership and education)
Estimated Annual Cost	N/A
Implementation Plan or Proposed Authority	State and Consumer Services Agency and/or the Department of General Services
Responsible/Affected Parties	State fleet operators
Proper Avenue of Enactment	Gubernatorial executive order or legislation

New Transportation Future and Revolving Loan Programs

CalSTEP recommends an increase in state-level investment in vehicle technologies that can reduce vehicular petroleum consumption and GHG and overall emissions. CalSTEP recommends the creation of:

- A \$140-million-per-year New Transportation Future program that provides competitive grants and/or creates a series of high-profile inducement prize competitions in California focused on facilitating the commercialization of advanced, clean, and low-GHG transportation technologies and fuels that reduce oil consumption in light-, medium-, and heavy-duty vehicles, and make the air cleaner while providing assistance for these technologies’ adoption.

- A \$25 million low-interest revolving loan or loan guarantee fund to reduce heavy-duty vehicle (Classes 3–8) petroleum consumption and GHG emissions.

As a whole, this program would serve as a “carrot” for a state that has a number of strong “sticks,” or regulations, thereby helping to meet ambitious criteria and GHG emission regulatory targets while creating new economic opportunities.

Continued Leadership Needed on Advanced Transportation Technologies

While there are a number of near-term technologies and fuels that can help secure California’s energy future, further advances are needed, and there is a significant shortfall of public investments in these technologies. In the United States, annual federal spending for all energy research and development is less than half what it was a quarter-cen-



tury ago.¹⁰⁹ According to W. David Montgomery of Charles River Associates, this is particularly problematic, for the race to stabilize world temperatures “will be an economic impossibility without a major R&D investment.”¹¹⁰

A large part of the problem is that many of the potential fuels and technologies are high risk, with long development and regulatory approval timelines, which discourages private investors and venture capitalists who tend to want a large payback within five years. Additional government funding is needed to encourage private-sector investment. Accordingly, CalSTEP recommends that the state invest the same level of funding allocated for the Carl Moyer program (\$140 million per year) in advanced, clean, and low-GHG transportation technologies for light-, medium-, and heavy-duty vehicles.

Competitive Transportation Energy Investment to Duplicate Moyer’s Superior Cost-Effectiveness

The first 50 percent (\$70 million) of this funding should be directed toward research, development, and demonstration of these technologies. Because a number of existing programs already support longer-term academic research, this program would be oriented toward technologies that have the potential to be commercially viable within three to five years. Grants would be awarded on a competitive basis by ranking proposals on petroleum and GHG and other emissions reductions achieved per dollar. Proposals that achieve the greatest savings per dollar would receive high-priority funding. For 80 percent of the funds, a 1:1 match would be required, meaning that for each dollar invested by the state, the grant recipient would have to provide at least another dollar of private, federal, or regional government investment. This requirement would help leverage the state’s investment. The remaining

20 percent of the funds would have a less stringent matching requirement to encourage the development of higher-risk concepts. For that portion, only a 25 percent match would be required. Thus, for every \$0.75 invested by the state, the recipient would have to provide only \$0.25.

The competitive nature of the grants would effectively duplicate the competitive aspect of the Moyer program, leading to superior cost effectiveness. The Moyer program was created in 1998 as a state and local partnership to improve air quality. It operates through the ARB, which distributes money to local districts to make grants for the most cost-effective measures to reduce emissions from heavy-duty vehicles. While Moyer originally focused on cost-competitive NOx abatement from heavy-duty vehicles, it was expanded in 2004 to cover PM, hydrocarbons, and light-duty vehicles. In addition, the funding was raised in 2004 from \$25 million per year to \$140 million per year. Moyer program funding comes from smog-check exemption fees that new-vehicle owners pay, a fee on tires, and an optional district increase in vehicle registration fees.

The Moyer program is famous for its cost-effective reduction of criteria emissions. In fact, in its first six years, the Moyer program averaged a superb \$3,000 per ton of NOx reduced.¹¹¹ By ranking the grant applications based on the level of petroleum and GHG reductions per dollar invested, the New Transportation Future program would seek to replicate the success of the current Moyer program in the area of petroleum and GHG reduction on a broader scale, applying to light-, medium-, and heavy-duty vehicles. If the track record of the Moyer program is a guide, a funding program focused on transportation energy and GHG emissions would provide superior cost-effective petroleum and GHG reductions while utilizing technologies capable of rapid deployment.

¹⁰⁹ Revkin, Andrew C. “Budgets Falling in Race to Fight Global Warming.” The New York Times. October 30, 2006.

¹¹⁰ Ibid.

¹¹¹ California Air Resources Board. Carl Moyer Program update presentation. January 20, 2005.



Competitive Inducement Prize Competitions Effectively Leverage Private Investment and Spur Industry Growth

A portion of this funding could be used by the state to initiate a series of high-profile inducement prizes and/or a series of smaller targeted competitions that would identify criteria for meeting goals and targets (including product characteristics and sales requirements) and then reward winners that achieve the goals with a cash prize and/or advanced market commitments. This model provides an enormous amount of leverage to help overcome numerous large and small barriers to reducing petroleum consumption and spurring alternative fuel use in California. Benefits might include:

- The creation and deployment of efficient transportation technologies and vehicles;
- The production and sale of various alternative fuels or fuel-related technologies;
- The creation and deployment of mass transportation technologies and platforms;
- The demonstrated reduction of various communities' need to drive;
- Positive national media exposure; and
- Increased private investment in California companies.

Historically successful inducement prizes include:

- The Longitude Act of 1714, which revolutionized navigation and time;
- The French Academy's 1791 Chemical Engineering Prize, which revolutionized chemical engineering;
- The 1927 Orteig Prize, which prompted Charles Lindbergh's solo flight across the Atlantic Ocean and revolutionized modern aviation;
- The 1992 Golden Carrot Prize, which revolutionized energy efficiency; and

- The 2004 Ansari X PRIZE, which revolutionized personal space flight.

Inducement prizes are very successful models not only for achieving goals, but also for leveraging private investment and achieving cost-effectiveness. The Ansari X PRIZE's \$10 million investment created more than twenty-four private space industry companies that collectively spent close to \$400 million in pursuit of the prize.¹¹² This 40:1 investment ratio is topped by the DARPA Grand Challenge, which achieved an estimated 50:1 investment ratio.¹¹³ Even the Orteig Prize achieved an 18:1 investment ratio.¹¹⁴ Furthermore, as these examples demonstrate, the visionary nature of inducement prize competitions enables them to capture the public's imagination and lead it to rally around a common cause.

Because of this proven leverage, a number of government agencies and nonprofit organizations are looking to inducement prizes as a tool for creating real change. A sample of this emerging "inducement prize industry" includes:

- NASA received U.S. congressional approval for \$250 million in prize money for its Centennial Challenges;
- The H Prize received U.S. congressional approval for \$100 million in prize money related to the production of hydrogen;
- DARPA continues to use prizes to forward innovation in a variety of military areas;
- The National Academies and the National Science Foundation received U.S. congressional approval to create the "Inducement Prize Project," which will research prizes for areas of discovery that have a "high risk and reward potential"; and
- The California-based X PRIZE Foundation will launch a series of "mega-prizes" focused on numerous issues and objectives.

¹¹² Schroeder, Alex. *The Application and Administration of Inducement Prizes in Technology*. Independence Institute. IP-11-2004. December 2004; p. 9.

¹¹³ *Ibid.* p. 3.

¹¹⁴ *Ibid.*



California inducement prize competitions that focus on transportation energy should be identified and managed by the CEC in consultation with the ARB, the Department of Food and Agriculture, the Integrated Waste Management Board, and the Department of Business, Transportation, and Housing. Project management of specific competitions can be managed in-house or contracted out to a California organization.

Whether the program is a competitive Moyer-like grant or an inducement prize competition, its prime contractors or recipients of the allocated funds would be California companies, universities, or nongovernmental organizations. However, non-California organizations could be members of teams that receive funds. Not all the work would need to be performed in California, but additional credit would be given for projects that would result in economic development within California, thereby supporting the growth of California's Clean Car Technology Cluster of companies and their associated contributions to the state's economy, which were described earlier.

Incentives for Deployment of Emerging Climate-Friendly Vehicles, Technologies, and Fuels

The remaining 50 percent (\$70 million) of the program's funding should be used to provide incentives for deployment of cleaner vehicles, technologies, and fuels that reduce GHG emissions to levels drastically lower than those of current-generation vehicles. The funding would go to measures that provide the highest amount of petroleum and GHG reductions per dollar invested, as ranked and determined by the CEC. Some examples of how incentives could be used include buying down the cost of vehicles and technologies spurred by the in-state inducement prize competitions, dramatically more efficient vehicles, alternative fuel stations (especially if these funds are invested in the manner described under the Alternative Fuels Infrastructure Partnership), and technologies offered by the EPA's SmartWaySM program that reduce heavy-duty vehicle fuel consumption and GHG emissions.

Complementary Low-Interest Revolving Loan Program for Heavy-Duty Vehicle Technologies

Heavy-duty vehicle operators can receive a direct financial payback by adopting efficiency-enhancing technologies. Accordingly, CalSTEP recommends a revolving low-interest loan program to complement the New Transportation Future program. Under the loan program, any heavy-duty vehicle owner or operator would be eligible to apply for funding, including fleet owners and independent operators. Such a program could be particularly helpful to independent truck operators, who usually purchase new trucks from fleets once the trucks are about five years old, and then drive them for another twenty years or so. These independents pay for their own fuel and are not always able to pass on high diesel costs to their clients. This revolving loan program would enable independents to pay for the efficient technologies that reduce petroleum consumption and save them significant amounts of money over their vehicles' lifetimes.

In lieu of a direct-lending component in this program, the revolving loan portion would provide loan guarantees for commercial lenders willing to make low-interest loans to independent owner-operators. Such a program could merely buy down a portion or all of the interest rate offered by commercial lenders, thereby reducing the logistical difficulties the state might encounter with high-volume loan applications and management.

Overall, this program would be augmented by the SmartWaySM Transport Partnership, a voluntary collaboration that is partnering with states such as Arkansas, Minnesota, and Pennsylvania to offer SmartWaySM Upgrade Kits composed of cost-effective technologies to reduce heavy-duty fuel consumption, lower GHG and other emissions, and save truckers money. Given proper state funding, which is provided under this revolving loan program, SmartWaySM can make it easier for heavy-duty vehicle users to identify relevant combinations of cost-effective technologies and facilitate their deployment.



Cost-Effective Technologies Can Make a Big Difference

A plethora of heavy-duty technologies are cost-effective, ready for implementation, and would be eligible for assistance under the New Transportation Future and revolving loan programs. A strength of these programs is that they are focused on the overarching goals of petroleum and GHG reductions, rather than on choosing which technologies to promote. Examples of potentially eligible technologies include, but are not limited to, those listed in **Table 6**.

A recent two-year collaborative study conducted by members of the Truck Manufacturers Association and the U.S. Department of Energy indicates that the widespread application of new aerodynamic technologies alone could significantly reduce fuel consumption. The combined effect of all aerodynamic improvements on one vehicle from techniques such as reducing gap enclosure, implementing side skirts, and redesigning side mirrors could result in as great as 23 percent reduction in aerodynamic drag, which would yield a fuel economy improvement of nearly 12 percent.¹¹⁵

Table 6: Potentially Eligible Technologies under the New Transportation Future and Revolving Loan Programs

Examples of Potentially Eligible Projects	Description	Petroleum/GHG Reduction Potential
Alternative fuel or hybrid vehicle retrofits	Vehicle conversion to run on natural gas, propane, electricity, or other ARB-approved alternative fuels	>50%
Auxiliary power units (APUs)	Efficient units powered by petroleum or alternative fuels that supply electricity and/or other amenities to slumbering trucks, thereby enabling the main engine to shut off and save fuel	~5–15%
Vehicular electrification	Enabling trucks to plug in and utilize electricity at truck stops for auxiliary power, allowing the main engine to shut off and save fuel during rest	>15%
Low rolling-resistance tires	Tires, such as the Michelin single-wide tire, that reduce the rolling resistance and the associated power required to move the vehicle, saving fuel	4–6%
Truck and trailer aerodynamics	Side-skirts, moldings, and other aerodynamic vehicular enhancements	5%
Onboard equipment that monitors fuel economy	Enables operators to adopt more economical driving habits	1–2%
Onboard equipment that monitors tire pressure	Enables operators to maintain appropriate tire pressure	3%

¹¹⁵ Green Car Congress. Study: Improvements in Large Truck Aerodynamics Could Save US Nearly One Billion Gallons of Fuel Annually. November 14, 2006. [Online] http://www.greencarcongress.com/2006/11/study_improvement.html#more



The SmartWaySM program provides an illustration of the potential cost savings from SmartWaySM Upgrade Kits that are composed of combinations of these technologies:

Possible SmartWay Upgrade Kit Options	Total Cost	Benefits (Monthly Fuel Savings)	Monthly Loan Payment @5% for 48 months	Net Monthly Savings
Heater, tires, aero, DOC	\$10,700	\$520	\$266	\$254
APU, tires, aero, DOC	\$17,700	\$636	\$440	\$196
Heater, tires, aero, PM filter	\$16,000	\$520	\$386	\$134

Source: <http://www.epa.gov/SmartwayLogistics/documents/420f06016.pdf>

Table 7: Wal-Mart 2507 Initiative Methods and Validated Results

GHG/Fuel Reduction Method	Size of Reduction
Fuel efficient tires (Super Single and/or FE Duals)	6%
APU (heating, cooling, battery charge, truck engine heat)	8%
Fuel additive (stabilizer and octane booster)	1.6%
Weight reduction (1124 lbs to date)	0.05%
Aero package (tractor only)	3%
Aero package (trailer contribution still under evaluation)	5.8%
Tag axle (reduce weight and rolling resistance)	TBD
Ultra shift transmission (direct versus overdrive)	TBD
Gear ratio validation (seeking optimum operating range)	TBD

Source: Wal-Mart

Interestingly, Wal-Mart provides an excellent example of how radical reductions in petroleum consumption can be achieved using a combination of simple technologies in conventional vehicles. The company's 2507 Initiative sets a goal of reducing by 50 percent the number of diesel-equivalent gallons of fuel used to move one ton one mile.¹¹⁶ While many techniques will be utilized to reach this target, including more efficient cargo handling and packaging, enhanced vehicular fuel economy is the main method of efficiency improvement that Wal-Mart is pursuing. The company has identified the methods and validated the size of petroleum savings, as listed in **Table 7**.

As one can see by looking at **Table 7**, Wal-Mart is achieving sizeable fuel reductions by utilizing simple and often inexpensive technologies such as improved aerodynamics and fuel-efficient tires. To obtain even better results, the company is planning to review hybrid-electric configurations, diesel-electric refrigeration, and further improved platform aerodynamics in the future.¹¹⁷ The CalSTEP low-interest revolving loan program would promote each of these technologies as well as their greater diffusion into heavy-duty vehicular platforms.

¹¹⁶ Bengé, Eric. ICCT Presentation. Wal-Mart. February 22, 2006.

¹¹⁷ Ibid.



Picture 3: Minor truck modifications, such as those demonstrated by Wal-Mart, lead to big fuel savings; such modifications could qualify for assistance under the New Transportation Future and Revolving Loan programs.

Picture 3, which compares Wal-Mart's 2005 base-line tractor/trailer configuration with a possible 2507 configuration, illustrates how minor modifications can lead to big fuel savings.

This revolving loan program would enable independents to pay for the efficient technologies that reduce petroleum consumption and save them significant amounts of money over their vehicles' lifetimes.

Summary: New Transportation Future and Revolving Loan Programs

<p>Proposed Action</p>	<ul style="list-style-type: none"> · Create a \$140 million-per-year competitive New Transportation Future program that provides grants and creates competitions focused on facilitating the commercialization of advanced transportation technologies and fuels that reduce oil consumption, while also providing incentives to users to adopt these products · Create a new \$25 million low-interest revolving loan or loan guarantee program to reduce heavy-duty (HD) vehicle (Classes 3-8) petroleum consumption and GHG emissions
<p>Objectives</p>	<ul style="list-style-type: none"> · Accelerate the adoption of advanced vehicle and fuel technologies · Cost-competitively reduce California petroleum consumption in heavy-duty fleets
<p>Outcome in 2020</p>	<p>Vehicles sold in 2020 use 15 percent less fuel than a business-as-usual scenario (contributing program)</p>
<p>Projected Annual Petroleum and GHG Reductions</p>	<p>0.3 BGGE of petroleum and 3 million tons of GHGs in 2020. (This program primarily supports and enables CalSTEP's overall efficiency goal.)</p>
<p>Estimated Annual Cost</p>	<p>\$140 million per year plus one-time \$25 million cost associated with establishment of the revolving loan program</p>
<p>Implementation Plan or Proposed Authority</p>	<p>CEC, ARB</p>
<p>Responsible/Affected Parties</p>	<p>Light-, medium-, and heavy-duty vehicle and vehicle technologies manufacturers</p>
<p>Proper Avenue of Enactment</p>	<p>Legislation</p>



Energy Independent Vehicle Labeling Program

CalSTEP proposes a voluntary vehicle labeling program that digests oil consumption and GHG emission data that are (or soon will be) parts of new California vehicles' window stickers into a simple, widely recognizable label with two grades that the public will understand indicate superior performance. Such a system would parallel previous success stories where so-called "green" labeling made significant progress in encouraging the public to support a common goal.

Success through Green Labeling

Repeatedly, green labeling has curbed the purchase and use of products associated with various social issues and/or encouraged the purchase and consumption of those that are more socially desirable. For instance, the "dolphin safe" tuna label, which expresses a product's compliance with fishing practices that don't harm dolphins, is simple, widely recognizable, and represents alignment with an issue that the public was educated to understand. Similarly, the EPA's Energy Star® program teaches consumers about the need for and benefits of increased energy efficiency, and encourages them to buy products with such traits. Its success comes from the fact that increased demand for Energy Star® products created a system in which manufacturers compete with each other to be designated an Energy Star® product, thereby driving up efficiency throughout the product category.

As exemplified by Toyota's "Hybrid Synergy Drive" badge, Honda's VTEC logo, and Ford's FFV/hybrid decal, green labeling has already made its way onto automobiles. However, these labels indicate technologies rather than performance standards, and are far from standardized across the manufacturing spectrum. For this reason, this program's vehicular label would instead reflect performance in reducing GHG emissions and oil consumption and would feature two different grades: one that reflects absolute performance and one that reflects performance relative to a vehicle's footprint size.

This two-tiered approach is superior to a single label for several reasons. A system that focuses only on absolute emissions and consumption neglects the majority of consumers who don't wish to buy the smallest and most efficient vehicles. And a system that focuses only on relative emissions and consumption can potentially mislead consumers: they may think, for example, that an ultra-efficient large vehicle is superior to an inefficient subcompact, which may not be the case. Combining the two approaches would give us the best of both worlds: it would promote the superiority of vehicles that are absolutely efficient regarding GHG emissions and oil consumption and also provide a useful educational tool for comparing the relative efficiencies of vehicles for consumers who may need larger vehicles to fit their lifestyles. Such a combination would encourage people to drive the best vehicles on the road, or failing that, to drive the best vehicles that meet their needs.

CalSTEP chose the metric used to measure vehicles' performance (GHG emissions plus oil consumption) based on its effectiveness at pursuing transportation energy security criteria. According to the Oak Ridge National Laboratory (ORNL), this metric, which considers two metrics together, proved superior at meeting overall objectives compared with other metrics such as miles per gallon. This combination provides incentives to increase vehicular efficiency and move toward alternative fuels.

Ranking Vehicles

Under the Energy-Independent Vehicle labeling program, automakers would be free to implement the technologies they wish, even technologies that have yet to be introduced, to achieve the petroleum reduction goals that would allow them to qualify for an award. The qualifications for each label would be as follows:

- The primary Platinum label would focus on absolute emissions and consumption: GHGs (measured in tons per year) added to oil (barrels per year) that a vehicle consumes. The vehicles with a number less than 15.5 in the



Table 8: Hypothetical Scenarios for Earning Primary and Secondary Labels (Base Year 2010)

Primary Labels Oil Use (barrels per year) + GHG Emissions (tons per year) ≤15.5 in 2010	Secondary Labels Oil Use (barrels per year) + GHG Emissions (tons per year)/Footprint Size ≤0.425 in 2010
<ul style="list-style-type: none"> · A pure gasoline-powered vehicle achieves ≥35 mpg in 2010, ≥44 mpg in 2020. · A natural gas vehicle achieves ≥15 mpg in 2010, ≥18 mpg in 2020. · An FFV with sufficient infrastructure achieves ≥22 mpg in 2010 and ≥26 mpg in 2020. 	<ul style="list-style-type: none"> · A small gasoline-powered vehicle (e.g., Chevy Aveo) approximates 34 mpg in 2010 and 41 mpg in 2020. · A small gasoline-powered SUV (e.g., Ford Escape) or small-to-midsize gasoline-powered sedan. approximates 30 mpg in 2010 and 36 mpg in 2020. · A midsize gasoline-powered vehicle (e.g., Toyota Camry) approximates 27.5 mpg in 2010 and 33 mpg in 2020. · A large gasoline powered SUV (e.g., Ford Expedition) approximates 23.5 mpg in 2010 and 28.5 mpg in 2020.

program's first year of implementation would be awarded the Platinum label. This number would decrease by 2.5 percent each year.

- A secondary Gold label would focus on relative emissions and consumption: GHG emissions and oil consumption would be added and then divided by the vehicles' footprint (square feet). The vehicles with a number less than 0.425 in the program's first year of implementation would be awarded the Gold label. This number would also decrease by 2.5 percent each year.

The calculations used to determine these numbers assume that:

- In the program's first year, the values associated with the labels should roughly capture the top 20 percent of performers, a standard that should increase each subsequent year.
- Vehicles travel 15,000 miles each year.
- The footprint is listed as square feet and is calculated by multiplying track width (the distance between the centerline of the tires) and wheel base (the distance between the centers of the axles).
- GHG emissions are determined by using fuel specification and emissions estimates from the

Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation Model developed by Argonne National Laboratory.

- Vehicles that are capable of running on alternative fuels as well as gasoline, like FFVs and bi-fuel vehicles, are running on alternative fuels 50 percent of the time if a sufficient fueling infrastructure is in place for the relevant alternative fuel. (The CEC would define "sufficient" as applied to each fuel.)

Table 8 provides hypothetical examples of some of the different combinations of efficiency levels and alternative fuels that vehicles can incorporate to earn primary and secondary labels.

While ORNL modeled its work on the Energy Star® program, bracketing the top 20 percent of vehicles each year and awarding them accordingly, CalSTEP's approach assigns specific criteria for meeting the requirements of each label. CalSTEP chose this approach because it would provide certainty for manufacturers should they plan for their vehicles to be awarded. Theoretically, under this scenario, an automaker's entire lineup could qualify for one or both awards, thereby providing a larger benefit to society. The qualifying numbers decrease over time in order to account for natural efficiency increases and further spur the utilization of efficient and/or



low-GHG technologies and fuels. The numbers for the primary and secondary labels are modeled on ORNL's work.¹¹⁸

Like other successful labeling programs, this program rewards vehicles with superior performance but does not affix a "scarlet letter"-type label to inferior vehicles. Furthermore, the program would be voluntary: Manufacturers wouldn't be required to affix these labels to their windows, but instead would be enticed to do so because of the labels' prestige and positive associations lent to their vehicles by displaying such an award.

Improving Public Recognition and Spurring Production of Efficient Vehicles

The success of this program would largely depend on the design and differentiation of the logos plus

consumers' knowledge of their existence and subsequent understanding of their meaning. To begin addressing these issues, the state would hold a design competition for the primary label as part of the program's initial launch and publicity campaign, differentiating it from the secondary label by changing its color scheme. Such a competition has precedent in California: in 2002, the state challenged residents to come up with a design for the state quarter. Over 8,000 people submitted designs within three months, and a twenty-member commission selected the ultimate winner. A vehicle label design competition could generate awareness of the problem of GHG emissions and oil consumption, enthusiasm for addressing it, superior out-of-the-box designs, publicity, and a grassroots source of the designs.

Summary: Energy Independent Vehicle Labeling Program

Proposed Action	Initiate a green labeling program that awards vehicles that produce low amounts of GHGs and consume low amounts of oil
Objectives	<ul style="list-style-type: none"> · Provide the car-buying public with a simple, easy-to-understand metric for recognizing which vehicles emit low amounts of GHGs and consume low amounts of oil on an absolute level and relative to vehicle size and utility · Prompt manufacturers to reduce vehicular GHG emissions and fuel consumption · Educate the public and generate widespread awareness about vehicular impact on energy security
Outcome in 2020	As an aggregate, new vehicles sold in 2017 are 15 percent more efficient than business as usual (contributing)
Projected Annual Petroleum and GHG Reductions	Supporter and enabler of CalSTEP's overall efficiency goal that leads to 2.9 BGGE of petroleum and 29 million tons of GHG reductions in 2020
Estimated Annual Cost	Marginal
Implementation Plan or Proposed Authority	CEC
Responsible/Affected Parties	Vehicle manufacturers and/or dealers are voluntarily affected
Proper Avenue of Enactment	Legislation

¹¹⁸ Greene, David L., et al. Energy Star Concepts for Highway Vehicles. Oak Ridge National Laboratory. June 2003.



The winning logos of the design competition winners would be copyrighted and standardized so that manufacturers could permanently place high-quality reproductions on the winning vehicles if they wished. According to U.S. copyright laws, the state would license the manufacturers of vehicles that are recognized under the program to reproduce and place the logos on the vehicles.

Neighborhood Planning Revolving Loan and Transit Use Assistance Programs

Like other CalSTEP programs, the Smart Communities program is embedded with inherent flexibility. The focus of the program is VMT reduction, but it allows regions to determine their preferred method. In order to facilitate the provision of multiple tools to achieve these objectives, CalSTEP proposes a Neighborhood Planning Revolving Loan program to be administered by the Department of Housing and Community Development, which would assist with the preparation and implementation of regional blueprints that meet the Smart Communities program's goal of reducing driving by 10 percent.

Current community planning in California takes place on the project level, with individual developers paying the cost of EIRs for specific properties they seek to develop. Moving the planning process to the programmatic level would allow communities to account for the ways in which properties and neighborhoods interact, adjust for driving increases, and streamline the process by which developers can obtain approval to implement smart growth development if they adhere to the programmatic plans.

The main barrier to programmatic planning is the cost: because it's higher and it benefits multiple projects, developers opt for project-level EIRs. The state's creation of a revolving loan program that is replenished by the fees that developers would have paid for project-level EIRs would allow program-level planning without costing developers more money. At a funding level of \$20 million per year for five years, the state would help overcome the largest barrier to

community planning on a programmatic level and, at its fully funded level, enable more than 30 concurrent programmatic EIRs, thereby significantly assisting with smart growth development.

The funds under this program could also be applied to the development of program-level EIRs based on regional blueprints. Such macro-level EIRs would focus on big-picture issues such as cumulative transportation, air quality, and land-use issues. Once local general plans are amended to implement these larger-scale regional plans, the reviews for projects within the preferred development scenario and consistent with a local government's general plan would be limited to design-specific issues. Local jurisdictions would retain control but could plan on a broader basis and streamline preferred development timing.

Because of the significant petroleum and GHG reduction potential of public transportation, CalSTEP also proposes that the state examine and offer incentives that spark greater use of public transit, and take steps in this area to further align state spending with the goal of reducing the need to drive. Examples of such incentives and alignment actions could include:

- Tax incentives to encourage employers to contribute financially to their employees transit commute to work and to coordinate such efforts with local transit agencies;
- Tax and other incentives for the establishment of privately funded amenities to public transit development projects, such as connections to transit stations, bus stop shelters, and off street layover facilities;
- Tax and other incentives for the adoption of "complete streets" standards to ensure that municipal thoroughfares are not designed for cars alone but also for transit users, pedestrians, and bicycle riders;
- Rewarding state-funded transportation projects that have a high level of employer participation in transit pass programs; and



Summary: Neighborhood Planning Revolving Loan and Transit Use Assistance Programs

Proposed Action	<ul style="list-style-type: none"> · Establish a Neighborhood Planning Revolving Loan program that expands the use of program-level EIRs that are based on regional blueprints · Focus project-specific EIRs on project design and direct on-site environmental effects while potentially expediting the development approval process · Provide tax and other incentives and align state spending to spark the greater use of public transit
Objectives	Fund smart growth implementation by facilitating program-level community planning and provide incentives for the use of public transit
Outcome in 2020	VMT reduced by 10 percent (contributing)
Projected Annual Petroleum and GHG Reductions	Supporter and enabler of CalSTEP's overall VMT goal that leads to 1.8 BGGE of petroleum and 18 million tons of GHG reductions by 2020
Estimated Annual Cost	\$20 million per year for five years
Implementation Plan or Proposed Authority	CTC; Caltrans; Department of Business, Transportation, and Housing
Responsible/Affected Parties	COGs, MPOs, developers
Proper Avenue of Enactment	Legislation

- Encouraging state-funded projects, such as subsidized housing and the construction of state and local public buildings, to be readily accessible to public transit.

Usage-Based “Pay As You Drive” Automotive Insurance

Current nationwide automotive insurance rates are structured as fixed and can often poorly reflect the real-world miles that a motorist drives. Accordingly, the EPA estimates that once an individual purchases a car, roughly 80 percent of their transportation costs remain the same on a monthly basis regardless of how much or little they drive.¹¹⁹ Under

this fixed-rate system, where motorists aren't provided with significant incentive to reduce their level of driving, the increase in traffic density from a typical additional driver increases total statewide insurance costs of other drivers by \$1,725 to \$3,239 per year.¹²⁰ In contrast, usage-based (“pay as you drive”) automotive insurance, which recognizes actual VMT and reduces premiums for motorists who drive fewer miles than their plans allow, can be a powerful tool, providing a financial incentive for reducing unnecessary vehicular trips.

Studies suggest that drivers paying per-mile premiums would be prompted to reduce driving due to average savings of \$50 to \$100¹²¹ or even more¹²² on

¹¹⁹ Environmental Protection Agency. Project XL. [Online] <http://www.epa.gov/projectxl/progressive/index.htm>

¹²⁰ Edlin, Aaron S., and Mandic, Pinar Karaca. “The Accident Externality from Driving.” *Journal of Political Economy* 114.5. 2006. pp. 931–955.

¹²¹ Litman, Todd Alexander. *Pay-As-You-Drive Pricing for Insurance Affordability*. Victoria Transport Policy Institute. May 17, 2004; p. 12.

¹²² Given that reduced driving reduces liability and collision exposure, form pay-as-you-drive automotive insurance in its purest would reduce these two aspects of motorists' policies proportionally with miles abated, so an owner of an undriven vehicle would pay only for the comprehensive portion of the policy.



their insurance premiums, without raising the cost of insurance for an average driver.¹²³ In fact, Washington State Department of Transportation market survey research indicates that offering vehicle insurance discounts based on reduced driving mileage is one of the most attractive incentives to encourage commuters to shift to ridesharing and transit. As a result, King County Metro, the largest rideshare and transit agency in the Puget Sound region, is seeking to partner with an insurance company to offer usage-based insurance to its 150,000 Transit Pass holders.¹²⁴ Insurers also like usage-based insurance because a 10 percent reduction in driving is estimated to result in a 12 to 15 percent reduction in total vehicular crashes.¹²⁵ Commuters in urban areas would especially benefit from the wide rollout of usage-based insurance, because traffic congestion delays could be reduced by 10 to 25 percent.¹²⁶

Usage-Based Insurance in Other States

In March 2002, the city of Philadelphia passed Resolution Number 020174, which authorized the City Council's Committee on Law and Government to "conduct a full and comprehensive investigation of the desirability of offering mile-based insurance to drivers in...Pennsylvania and directing the Committee to communicate its findings to the Mayor's Task Force on Automobile Insurance Rate Reduction and the Pennsylvania General Assembly."¹²⁷

In June 2003 the Oregon legislature passed HB 2043, which provides a \$100-per-policy tax credit to insurers that offer usage-based pricing. The Oregon Environmental Council is working with the EPA,

Environmental Defense, and others to build a database of potential usage-based insurance customers to convince the insurance industry that a market for usage-based insurance exists, and it is meeting with insurance companies to encourage them to offer usage-based insurance.¹²⁸

In Massachusetts, the Environmental Insurance Agency is partnering with the Plymouth Rock Assurance Corporation to offer policies to members of the Transportation Alliance, a "green" buying club that brokers discounts on environmentally friendly products. They are attempting to accumulate data proving that low-mileage drivers cost less to insure, with the intent of petitioning insurance regulators in Massachusetts to authorize a usage-based program.¹²⁹

Real-World Usage-Based Automotive Insurance

In 1998, the Progressive Group of Companies of Mayfield Village, Ohio, launched a two-year usage-based automotive insurance pilot program in Texas dubbed AutographSM. The program proved popular, providing savings of 25 percent (on average) over traditional insurance policies as people chose to drive less.¹³⁰ Partly in response to the success of this program, Texas passed HB 45 in 2001, the "cents per mile choice," which as introduced would have ordered all automotive insurance companies to eventually offer cents-per-mile policy prices, but in reality became a voluntary program designed to encourage industry cooperation in making mandatory insurance work.¹³¹

The success of the Texas pilot program led Progressive to roll out a larger usage-based insurance program in Minnesota dubbed TripSenseTM. Like the Texas

¹²³ Baker, Dean. "Insurance by the Mile: A Simple Way to Slow Global Warming." Harper's Magazine. June 2006.

¹²⁴ Pay-As-You-Drive (PAYD) Auto Insurance. Environmental Defense. [Online] <http://www.environmentaldefense.org/article.cfm?ContentID=2205>

¹²⁵ Litman, Todd Alexander. Pay-As-You-Drive Pricing for Insurance Affordability. Victoria Transport Policy Institute. May 17, 2004; p. 12.

¹²⁶ Pay-As-You-Drive Vehicle Insurance, Converting Vehicle Insurance Premiums Into Use-Based Charges. TDM Encyclopedia, Victoria Transport Policy Institute. Updated December 14, 2005. [Online] <http://www.vtppi.org/tdm/tdm79.htm>

¹²⁷ Resolution No. 020174. Council of the City of Philadelphia. [Online] http://www.environmentaldefense.org/documents/2226_tasco.htm

¹²⁸ Litman, Todd Alexander. Pay-As-You-Drive Pricing for Insurance Affordability. Victoria Transport Policy Institute. 17 May 2004; p.16

¹²⁹ State Environmental Resource Center. Pay-As-You-Drive Auto Insurance, Policy Issues Package. [Online] <http://www.serconline.org/payd/background.html>

¹³⁰ Frey, Joe. "Progressive's 'Pay As You Drive' Auto Insurance Poised for Wide Rollout." [Online] <http://info.insure.com/auto/progressive700.html>

¹³¹ National Organization for Women. CentsPerMileNow. [Online] <http://www.centspermilenow.org/>



program, participation in TripSense™ is voluntary and an insured motorist may stop participating and switch back to a conventional policy at any time. Unlike the Texas program, which relied upon GPS, mobile phone, and crash-data recorder technologies, TripSense™ gives customers a data-collection device (DCD) called a TripSensor™, which plugs into their vehicle and captures usage information. Customers automatically receive a 5 percent discount when they sign up for the program. At renewal, they receive a 5 percent discount for sharing the vehicle information with Progressive; they can earn an additional discount of up to 20 percent based on how much, how fast, and when the vehicle is driven.

Until TripSense™ customers upload the information to Progressive, they retain full control over the data collected by the device. At any time, they can disengage the DCD from their vehicle, though the device must be installed for at least 95 percent of the data collection period for customers to qualify for a discount. Customers can connect the TripSensor™ to a personal computer and review their driving data before deciding whether to share it with Progressive. They can even delete the data if they wish.

Progressive is not the only company offering usage-based automotive insurance. General Motors' GMAC Insurance is providing discounts to OnStar customers in Arizona, Indiana, Illinois, and Pennsylvania who opt into a usage-based program. The discounts, as percentages, are greater the less one drives. In the United Kingdom, Norwich Union received overwhelming initial response to its announcement of a usage-based program.¹³²



Progressive TripSense™ Unit

Changing California law to allow the more accurate collection of vehicular data, and to offer discounts based on the collection of this data, would allow companies that are currently offering usage-based insurance policies, such as Progressive and GMAC, to offer such policies in California. It would also, through competition, encourage other automotive insurers to develop and implement usage-based policies, thereby allowing participating drivers to keep more money in their pockets should they decide to drive less.

Bringing Usage-Based Automotive Insurance to California

Unfortunately, California law actively prevents insurance companies from pursuing even voluntary programs that would improve collection of real-time miles-traveled data, financially reward motorists for participating in usage-based automotive insurance, and facilitate the use of such programs.

Section 1861.02(a) of the California Insurance Code states that the primary factors in determining auto insurance rates, in decreasing order of importance, shall be: (1) The insured's driving safety record; (2) the number of miles he or she drives annually; and (3) the number of years of driving experience the insured has. While the law mandates that mileage be one of three primary factors in determining auto insurance rates, the California Department of Insurance requires insurers to use a policyholder's estimate of the annual miles that a policyholder expects to drive in the subsequent 12-month period and prevents insurers from calculating the insured's rate for the policy term in which mileage was actually driven.

Though the department is in the process of issuing a new regulation that will allow insurers to request certain objective information to track the insured's mileage, the regulation asserts that the information must be used prospectively. For example, a new policyholder might provide an odometer reading of 50,000 miles, and also provide an annual mileage estimate of 10,000. If, at the end of an annual policy, the policyholder's odometer is 70,000, the insurer may not adjust the premium for that annual policy,

¹³² Litman, Todd Alexander. Pay-As-You-Drive Pricing for Insurance Affordability. Victoria Transport Policy Institute. May 17, 2004; p. 15.



though it does have certain rights to adjust the estimate for the subsequent policy period. This is not true usage-based pricing, and consumers can easily game the mileage estimate.

To bring usage-based automotive insurance to California, the California Code of Regulations, Title 10, section 2632.5 needs to be modified as follows:

1. **DCDs must be allowed to collect mileage information.** To enable true usage-based insurance, California law must allow an insurer to use technological means to capture mileage information during a policy term and to use that information to adjust the premium for that term.
2. **The code must provide for discounts to drivers who report mileage using DCDs.** While there are three primary factors in determining automotive insurance rates, there are sixteen secondary rating factors that can be used in any combination to less significantly determine spe-

cific rates and calculate the premium. These secondary rating factors may include marital status, frequency and severity of claims in the geographic area where your car is garaged, gender, vehicle type, and so on. These secondary factors should be amended to allow discounts for users who participate in usage-based programs. Without discounts for using DCDs and sharing data, insured motorists may not have an incentive to participate in usage-based rating programs, at least until the cost-saving benefits of such programs become apparent.

In the future, after these modifications to the California Code of Regulations have been made and insurance providers' and motorists' responses can be gauged, the state could explore providing incentives to entice insurance companies to offer consumers a choice between time-based and mile-based premiums, as groups such as the National Organization of Women advocate.¹³³

Summary: Usage-Based "Pay As You Drive" Automotive Insurance

Proposed Action	Change the California Code of Regulations to allow insurance providers to implement voluntary programs and technologies that more accurately track vehicle mileage, and to provide these insurers with the authority to offer discounts based on the adoption of such programs, the reporting of miles traveled, and the reduction of vehicle miles traveled (VMT)
Objectives	Provide monetary incentives to drivers who drive less, thereby assisting with the reduction of VMT by at least 10 percent
Outcome in 2020	VMT reduced by 10 percent (contributing)
Projected Annual Petroleum and GHG Reductions	Supporter and enabler of CalSTEP's overall efficiency goal that leads to 2.9 BGGE of petroleum and 29 million tons of GHG reductions in 2020
Estimated Annual Cost	Cost savings to drivers who participate in usage-based programs
Implementation Plan or Proposed Authority	California Department of Insurance
Responsible/Affected Parties	Auto insurers, motorists
Proper Avenue of Enactment	Modification of regulation either by the commissioner or through legislation

¹³³ NOW has created a model for this legislation: <http://www.now.org/issues/economic/insurance/bill.html>

Additional Information





CalSTEP Background

The California Secure Transportation Energy Partnership (CalSTEP) launched in June 2005 as a public-private partnership composed of diverse California stakeholders and decision makers who wish to move beyond political impasse to reach consensus on and implement specific strategies to increase California's transportation energy efficiency and alternative fuel use, while growing the economy, reducing GHG emissions, and improving the overall welfare of Californians.

The underlying assumption of CalSTEP is that California doesn't have to wait for federal action to experience the benefits of decreased oil dependence. Instead, precedent indicates that the state has the ability and, with the failure of federal leadership, the duty to move forward with an aggressive yet thoughtful and comprehensive strategy to move beyond oil. As repeatedly demonstrated, such state leadership can grow the economy and lead to adoption by other states and, eventually, the federal government.

Accordingly, CalSTEP advocates for the advancement of state-level legislative measures, local initiatives, corporate actions, and enhanced public awareness to achieve the following goal:

A sustainable reduction in the overall on-road petroleum fuel consumption in California to at least 15 percent below 2003 levels by 2020 while increasing the proportion of alternative transportation fuels in the state to at least 20 percent of total on-road transportation fuel demand.

CalSTEP partners agreed that actions taken to achieve this goal should also achieve the following objectives:

- Benefit state and local business and economies
- Promote sustainable growth
- Focus on multiple transportation fuels, technologies, and platforms
- Maintain or improve environmental quality and public safety
- Build upon previous efforts (when applicable)
- Focus on state-level actions and measures
- Empower local stakeholders and governments

CalSTEP is a diverse and bipartisan coalition of key California stakeholders from the private, public, and nongovernmental sectors. By arranging itself in this manner, CalSTEP seeks to move past political impasse, not just to provoke research and education but also to help create consensus and spur action within California to secure the state's transportation energy future.

CalSTEP Principles and Process

The CalSTEP process for creating this Action Plan was a thoughtful, pro-business approach that took over a year and a half from initiation to completion.

From the beginning of summer 2005 through the end of 2006, CalSTEP Partners met monthly to chart a course for more sustainable transportation energy consumption and economic growth in California. At these meetings, the partners reviewed and discussed material that CALSTART staff had researched and presented.

The process was very deliberate and incremental: discussing broad issues at initial meetings, refining these issues at subsequent meetings, and outlining the fine points and details at the final meetings. Accordingly, the partnership produced several interim documents that reflected its process and its progress. The first document was the CalSTEP "Framework for



Action,” which articulated the partnership’s bylaws and the principles it would adhere to. This document was presented at the CALSTART 2020 conference in December 2005, one year from the call to action that led to CalSTEP’s creation.

In late 2005 and early 2006, the CalSTEP Partners identified four near-term, high-impact measures that California could take to reduce its petroleum consumption:

- **Using More Renewable Fuels**

CalSTEP recommends an aggressive increase in the replacement of fossil fuels with biofuels such as biodiesel, ethanol, and biomethane (especially those that are produced in California), in both low and high percentages for on-road transportation purposes. Such action can rapidly reduce California’s oil dependence while meeting all the state’s needs, including those concerning air quality, health, and economic welfare.

- **Investing in Transportation Energy Security**

CalSTEP recommends increasing investment in measures that will improve the state’s transportation energy efficiency and diversify its fuel supply. Financing for this fund could come from the governor’s infrastructure development bond, a small public-goods charge on gasoline and diesel fuel, a fee levied on containers that carry goods through California ports, or comparable measures.

- **Spurring Model State, Local, and Private Fleets**

CalSTEP recommends directing and funding state fleets to go beyond Energy Policy Act requirements and purchase significantly more efficient (>20 percent) and/or alternative-fuel vehicles, and ensure that bi-fuel or flex-fuel vehicles are operated on alternative fuels. This action will not only serve as an example to the state’s local, corporate, and other fleets, but will also use the state’s economic power to help

expand the market for advanced vehicles, thus enabling other fleets to follow the state’s lead.

- **Leveraging State Transportation Infrastructure Funding to Reward Smart Growth and Energy-Efficient Transportation**

State funding should be used for roads, infrastructure, and the movement of goods to spur the implementation of smart growth and energy-efficient transportation measures. An essential first step is for the state to direct Caltrans to actively work with metropolitan planning agencies and local governments to link transportation funding with smart land-use policies that result in more efficient transportation energy use. Governor Schwarzenegger has proposed measures to mitigate air pollution from the growing goods movement industry, and the state should develop similar programs to expand the fuel supply by encouraging alternative fuels and high-efficiency cargo vehicles.

Several CalSTEP partners approached various members of the legislature and state governmental organizations in February 2006 to draw attention to the partnership’s initial recommendations.

During CalSTEP’s March 8, 2006, meeting in San Diego, the partnership reviewed a report presented by Navigant Consulting to the CEC regarding the commission’s recommendations to Governor Schwarzenegger to increase biofuel use and decrease oil consumption. After reviewing the consultant’s initial recommendations, the partnership provided the following recommendations at a CEC hearing on March 9 in Sacramento:

1. **No backsliding on biofuel blending.** In response to the draft report’s recommendation that the “Air Resources Board ... develop regulations that maximize the flexibility of using biofuels, while preserving the environmental benefits of their use,” CalSTEP recommended that by 2008, the state should explicitly incorporate a minimum



- pooled renewable fuels standard (about 6 percent) into its existing fuel regulatory activity. Furthermore, CalSTEP strongly supported the state's overall alternative fuel goal (20 percent by 2020) and the role of biofuels in meeting this goal.
2. **Lead the creation of biofuel specifications.** CalSTEP recommended that the governor direct the ARB and the CEC to set fuel specifications for appropriate biodiesel blends, including B10. CalSTEP also encouraged the state to work with the federal government and other states, or act on its own, to create interim standards until ASTM specs are established.
 3. **Examine reformulated gasoline composition to accommodate higher biofuel blends.** In response to the draft report's recommendation that the state conduct "a comprehensive and peer-reviewed study of the costs, emissions impacts, and fuel supply consequences of low-level ethanol blends (i.e., E6 to E10), and incorporate the study findings into the rulemaking process," CalSTEP recommended that the ARB, in coordination with the CEC, commission a study to determine how the composition of reformulated gasoline can be changed so that net emissions do not increase when using higher biofuel blends (such as E10).
 4. **Aggressively increase E85 availability and use.** In response to the draft report's recommendation that the state address "the emissions performance, fuel supply consequences and cost issues surrounding greater use of E85 in California," CalSTEP recommended that the state provide mechanisms for E85 growth that parallel the state's Hydrogen Highway efforts. However, the partnership stated that this should not be an approach driven by regulation, but rather should focus on incentives, pricing, economics, and the free market to create a climate where E85 can be competitive in California.
 5. **Increase and ensure state fleet E85 usage.** CalSTEP agreed with the draft report's recommendation to "direct state agencies to purchase biofuels, bio-based products, and biopower, including combined heat and power where possible, with specific targets for 2010 and 2020," and to "encourage local governments and public institutions to follow the state's lead." In its presentation, CalSTEP pointed out that of the more than 5,200 AFVs in the 2002 state fleet, only 63 (1.2 percent) were fueled with alternative fuels, leaving the remaining 98.8 percent to be fueled with conventional gasoline. Accordingly, CalSTEP recommended that the secretary of the State and Consumer Services Agency develop a plan to be used in the procurement process for vehicles and fuels to most effectively reduce the state fleet's petroleum consumption. The plan should be completed and delivered by the end of 2007 and ensure that the state's AFVs operate on alternative fuels. The state should implement E85 pumps at its refueling facilities so that 50 percent of state's FFVs operate on E85 by 2010 and 90 percent of state's FFVs operate on E85 by 2012.
- CalSTEP also submitted letters of support for three pieces of legislation that made their way through the California legislature in 2006: AB 1020 (improved transportation modeling to support smart growth), SB 1675 (biodiesel blending), and SB 1511 (gasoline modeling that accounted for renewable fuel usage). From March through December 2006, however, the partnership focused its energies on the completion of the CalSTEP Action Plan.




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