



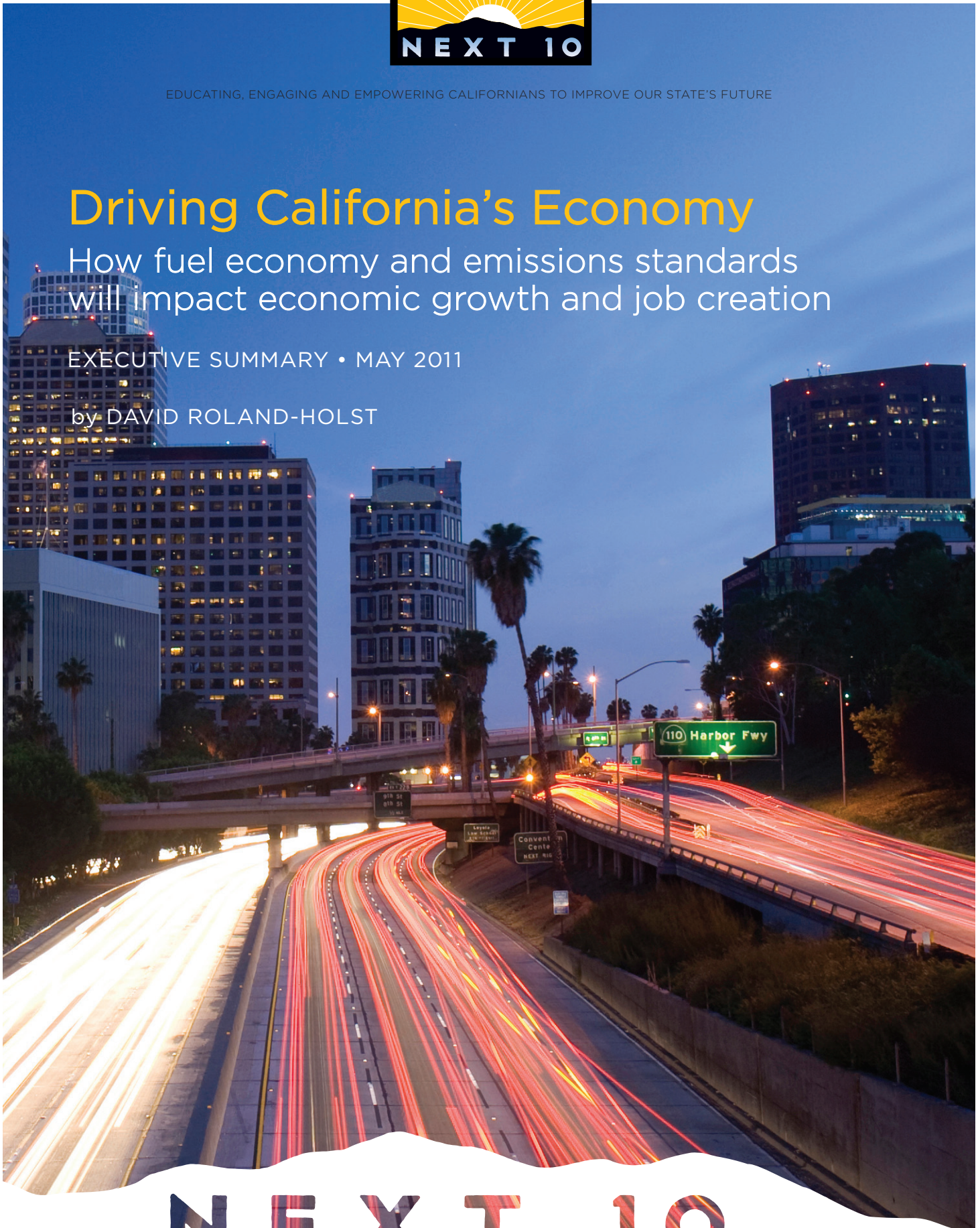
EDUCATING, ENGAGING AND EMPOWERING CALIFORNIANS TO IMPROVE OUR STATE'S FUTURE

# Driving California's Economy

How fuel economy and emissions standards will impact economic growth and job creation

EXECUTIVE SUMMARY • MAY 2011

by DAVID ROLAND-HOLST



# NEXT 10

California's love affair with cars is a mixed blessing for the state economy. While providing essential transportation, productivity, and personal services, the infrastructure needs and emissions that arise from all our driving represent large costs to society. To address the broader public interest in environmental quality, the state has committed to more stringent regulation of greenhouse gas (GHG) emissions from passenger cars, SUVs, and light trucks, which represent about 60 percent of California's global warming pollution.

Unlike the State of California or any other state in the nation, agencies at the federal level may directly regulate passenger vehicle fuel economy. The environmental justification for both the federal fuel economy standards and the California emissions standards is obvious, but because they require changes in behavior, technology, and economic relations, the policies are controversial. This study, *Driving California's Economy: How fuel economy and emissions*



*standards will impact economic growth and job creation, provides new evidence to support more informed public and private dialog on the economic implications of more stringent vehicle emissions standards at the state level, as well as more stringent vehicle fuel economy standards at the federal level. Generally speaking, we find that higher standards (of both types) increase economic efficiency, and bring significant long-term gains for California's economy.*

## Research Findings

*Driving California's Economy: How fuel economy and emissions standards will impact economic growth and job creation* is a peer-reviewed study using a state-of-the-art economic forecasting model to evaluate five possible scenarios for vehicle emissions and mileage standards. The model projected macroeconomic aggregates, energy use, and emissions patterns between now and 2025.

### KEY FINDINGS INCLUDE:

- 1. A cleaner, more efficient passenger vehicle fleet creates significant consumer savings. Savings are reinvested into local economies—a potent catalyst for economic growth.** By reducing fuel use, cleaner, more efficient vehicles save families and businesses money. These savings tend to be spent on goods and services that are less import-dependent and more job-intensive; therefore, they have stronger “multiplier” effects in state, and create more jobs than they displace.
- 2. Increasing fuel efficiency and decreasing emissions from passenger vehicles creates jobs across the economy, far beyond what are thought of as “green” sector and “green collar” jobs.** As an added benefit: the majority of new demand is financed by savings from fuel economy and goes to in-state service employment, jobs that cannot be outsourced.
- 3. Clean car technologies that act to reduce GHG emission intensity and increase fuel economy are a source of economic growth, job creation, and lower energy prices.** As standards at the federal and state level steer the state’s vehicle fleet toward ever-greater fuel efficiency and lower emissions, pressure on long-term California household energy costs will be reduced, cutting future energy prices and boosting energy security for all consumers
- 4. Vehicle fuel economy and emissions standards will lower energy costs even for those who hold on to their gas-guzzlers.** California families benefit from state greenhouse gas emissions standards and federal fuel economy policies, whether they buy new cars or not.
- 5. The observed “rebound” effect, which refers to more driving in response to lower energy prices, lower cost of driving, and rising incomes, is very modest in California.** Our results show that the rebound effect amounts to less than ten percent of net fuel savings from federal fuel economy standards, leaving the bulk of the efficiency benefits to California’s economy intact.

### THE BOTTOM LINE:

Federal fuel economy standards and California emissions standards will enable California to enjoy significant reductions in energy dependence and global warming pollution, stimulating statewide economic activity and employment with substantial fuel savings.

### Methodology:

After detailed examination of baseline growth characteristics, policies in place or under active discussion, and technology opportunities, we selected five scenarios designed to represent the leading policy options open to California over the next generation.

**The modeling showed that statewide economic growth and employment rise with the degree and scope of federal and California vehicle standards—the higher the standards, the greater the economic benefits to California.** This is true for both direct fuel consumption standards (such as the federal Government’s fuel economy standards) and for indirect standards that target emissions (such as California’s greenhouse gas emission standards).

Table 1: Statewide Impacts				
	Cal	Nat4	Nat6	Hzn
Real GSP	0.03%	0.82%	1.13%	1.31%
Real Consumption	0.03%	0.68%	0.92%	1.05%
Employment	0.17%	0.69%	0.89%	1.02%
Jobs (1000)				
Created	47	179	231	264
Lost	-9	-21	-26	-28
Net	38	158	205	236
MPG (Fleet Ave)				
Gasoline	23	28	32	34
Diesel	11	13	15	17
Emissions				
Household	-14%	-22%	-26%	-29%
Industry	-4%	-9%	-11%	-13%
Total	-8%	-14%	-17%	-19%

Notes: Percentages measure change from the No Vehicle Standards values in 2025.

## THE SCENARIOS EXAMINED WERE:

- 1. No Vehicle Standards** — Assumes California did not adopt state emissions standards and the federal government did not adopt fuel economy standards post 1990. California continues growth at levels forecast by the Department of Finance.
- 2. California Vehicle Standards (Cal)** — Assumes the Low Carbon Fuel Standard and 2016 state vehicle emissions standards remain unchanged until 2025. Compared to the No Vehicle Standards scenario, this scenario results in 38,000 additional new jobs; an additional .03 percent growth in Gross State Product (GSP) and an 8 percent reduction in GHG emissions for California by the year 2025.
- 3. National 4 Percent (Nat4)** — Assumes the federal government passes a 4 percent per year increase in fuel economy standards over 2017-2025 (equivalent of a federal 37 mpg average by 2025 and a 46 mpg new vehicle standard by 2025).<sup>1</sup> Compared to the No Vehicle Standards scenario, this would result in 158,000 additional jobs, an additional .82 percent growth in GSP, and a 14 percent reduction in California's trend GHG emissions by 2025.


**4. National 6 Percent (Nat6)** — Assumes the federal government passes a 6 percent per year increase in fuel economy standards over 2017-2025 (equivalent of 43 mpg fleetwide average in California by 2025 and a 54 mpg new vehicle standard by 2025).<sup>2</sup> Compared to the No Vehicle Standards scenario, this would result in 205,000 additional jobs by 2025, and an additional 1.13 percent growth in GSP. California's trend GHG emissions would be reduced by 17 percent.

**5. Horizon (Hzn)** — Assumes that the federal government passes a 6 percent per year increase in fuel economy standards over 2017-2025 (equivalent of a 54 mpg new vehicle standard by 2025 and a 52 mpg fleetwide average in California for light vehicles by 2025)<sup>3</sup> and that standard drives the development of new state-of-the-art vehicle technology. Compared to the No Vehicle Standards scenario, this would result in an additional 236,000 new jobs and an additional 1.31 percent growth in California GSP by 2025, along with a 19 percent cut in GHG emissions.

## Conclusions

The idea that there is a necessary trade-off between environmental goals and economic growth is a fallacy. In California, we have proven this before with electricity use and, as our study results indicate, we are ready to prove it again with clean cars. Thirty years of efficiency policies in the electric power sector contributed to substantially higher California economic growth and employment. Fuel economy and emissions measures in the vehicle sector will expand incomes and jobs in the same way.

Using a long-term economic forecasting model that details patterns of vehicle ownership and use across the state, we evaluated a variety of scenarios from existing vehicle emissions rules to standards representing higher expectations for emerging vehicle technology. In all cases, direct and induced fuel savings translated into significant emissions reductions and new demand for



more job-intensive goods and services, most of which were in sectors with less import dependence and more extensive in-state multiplier benefits. Fuel savings, whether direct from mileage standards or induced from emissions standards, resulted in expenditure shifting, moving demand away from the carbon-fuel supply chain and toward in-state goods, services, and job creation across a broad economic spectrum.

Our results also support the strategic argument that fuel economy and emissions standards confer economic security against volatile energy prices. Even for an economy the size of California's, energy markets are largely beyond our control. The smaller the share of income that goes to transportation fuel, the less vulnerable we are to shocks from energy prices.

These results remind us that efficiency merits deeper consideration across the full spectrum of energy uses, including reconfiguration of transportation services, infrastructure, and many non-transportation energy uses. At the same time, rapid innovation in energy supporting and supported by IT, communication, materials science, and electronics are all converging to support a lower carbon, more energy-efficient future.

Finally, although fuel savings promote growth and energy security for the vast majority of Californians, there are of course some actors linked to the fossil fuel supply chain that will be adversely affected by these policies. Temporary adjustment assistance could facilitate their support in helping us realize our efficiency potential. It could be a small price to pay for the lasting benefits of California's transition to a more sustainable and prosperous future.

## ENDNOTES

1. Under ideal conditions, a 4 percent annual improvement rate in fuel economy for new light vehicles could yield a federal fuel economy standard of 46 mpg by 2025, but at historical fleet turnover rates, the average fuel economy of vehicles in California would only be 37 mpg.
2. Under ideal conditions, a 6 percent annual improvement rate in fuel economy for new light vehicles could yield a federal fuel economy standard of 54 mpg by 2025, but at historical fleet turnover rates, the average fuel economy of vehicles in California would only be 43 mpg.
3. In the Horizon scenario, we assume more aggressive efficient vehicle adoption, yielding a 52 mpg average by 2025.

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