



# Driving California Forward

Public Health and Societal Economic Benefits  
of California's AB 32 Transportation Fuel Policies

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LCFS AND CAP-AND-TRADE REGULATIONS

Environmental Defense Fund / American Lung Association in California / Tetra Tech

# Executive summary

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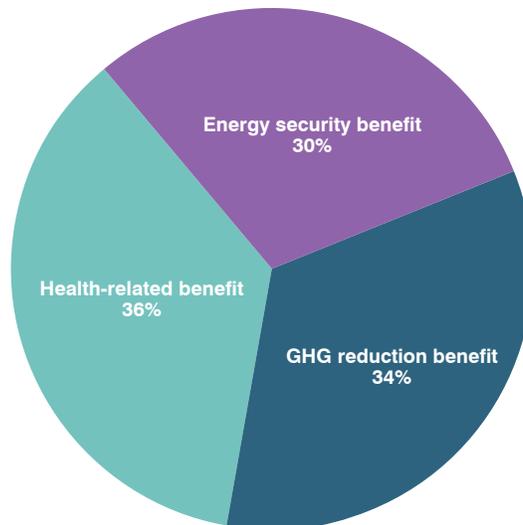
The transportation sector is the largest source of pollution in California, contributing close to 70% of smog-forming gases and 40% of the state's climate change pollution every year. Consequently, the current transportation system is responsible for a significant portion of the adverse health impacts that citizens suffer from, in addition to causing energy vulnerability that threatens economic stability and contributing to climate change that threatens the future of our state and planet.

California can reduce these severe negative impacts by cutting the overall system's rate of pollution that endangers public health (e.g. NO<sub>x</sub>, SO<sub>x</sub>, and PM<sub>2.5</sub>), growing the volume of domestically produced clean fuels, and cutting carbon pollution from fuels. Among the many policies being pursued to drive this transformation are the state's AB 32 Low Carbon Fuel Standard (LCFS) and cap-and-trade regulation (C&T).

This analysis calculates the economic benefit of the LCFS and C&T by evaluating the societal benefits of full implementation in 2020 and 2025, which include 1) avoided public health costs and incidents of illness, 2) avoided fossil fuel dependence costs, and 3) avoided climate change-related costs (see Figure E-1 below for the proportion of the total societal economic benefit attributed to these three components). These benefits are compared to a baseline that does not factor in those policies to show that by 2025, the LCFS and C&T will incentivize the shift to a cleaner transportation fleet that will save the state and its citizens money.

**FIGURE E-1**  
**Breakdown of net societal economic benefit by component (2025)**

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## Combined benefits of LCFS and C&T fuel regulations

Modeling conducted for this report shows that without the LCFS and C&T, the California transportation system is expected to result in cumulative societal economic impacts of \$274 billion by 2020 and \$387 billion by 2025. The transition to a cleaner and more diverse vehicle fleet will require investments in alternative fuel production and infrastructure. According to modeling conducted in this analysis, the LCFS and C&T regulations will result in cumulative benefits from avoided health, energy insecurity, and climate change costs of \$10.4 billion by 2020 and \$23.1 billion by 2025. The model used in this report includes benefits from both the light-duty (e.g. passenger cars and light trucks) and heavy-duty (e.g. on- and off-road trucks and buses) sectors. Each of the three components studied in this report are described in further detail below.

## Health effects of the current transportation system and benefits of new fuel regulations

Among the many documented impacts of air pollution generated from cars and trucks is increased risk of asthma attacks, heart attacks, cardiovascular disease, respiratory ailments, and cancer, as well as shortened lifespan. This pollution is particularly detrimental to more vulnerable populations, such as infants, children, and the elderly; low-income and disadvantaged individuals who are already exposed to increased amounts of pollutants; and people with pre-existing lung and heart diseases. All told, air pollution has been estimated by the California Air Resources Board to cause 9,200 deaths in California per year, with more recent research indicating that approximately 21,000 deaths per year in California are caused by roadway pollution.

A 2011 American Lung Association in California report entitled *The Road to Clean Air*, which this report builds on, demonstrates that a reduction in transportation pollution from increasing cleaner and more efficient passenger vehicles will improve the quality of the air and reduce the incidence of observed health impacts. This transition will not only directly improve health, but also create billions of dollars in annual economic benefits in the form of fewer missed work days and fewer expensive hospital visits.

Pursuant to the analysis presented in this report, the increased use of cleaner fuels through implementation of the LCFS and C&T program will substantially improve air quality and reduce climate pollution generated in California leading up to 2020 and beyond. By 2025, when a significant part of the vehicle and fuel mix will have been influenced by the LCFS and C&T, communities can expect a cumulative benefit from the LCFS and C&T that includes:

- Savings of \$8.3 billion in pollution-related health costs
- Prevention of 600 heart attacks and 880 premature deaths caused by air pollution
- Prevention of 38,000 asthma attacks and almost 75,000 lost work days
- Reduction of criteria pollutant emissions by almost 180,000 tons

## Energy security benefits of transportation fuel regulations

California's reliance on imported oil for transportation energy is documented to be a major factor that contributes to the state's economic vulnerability. According to research on the U.S. economy-wide impact of energy dependence on imported oil, the cumulative cost was more than \$2 trillion from 2007 to 2011.

By creating a regulatory signal to diversify the state's fuel mix with a portfolio of lower carbon fuels, many of which are produced domestically in California or in other parts of the U.S., the LCFS and C&T will decrease costs associated with energy dependence (including associated supply vulnerability costs) on imported oil. By 2025, petroleum use and import

reductions that lead to greater energy independence will produce significant cumulative fiscal and societal benefits, including:

- Savings of approximately \$6.9 billion from increased energy independence
- Reduced consumption of gasoline by 21.4 billion gallons
- Reduced consumption of diesel by 11.8 billion gallons

### **Climate change-related benefits (known as the “social cost of carbon”) of transportation fuel regulations**

Global climate change is linked to significant economic costs because of its causal connection to disruptive impacts such as extreme weather events, higher temperatures, changing precipitation patterns, and sea level rise. The social cost of carbon therefore takes into account climate change damages like changes in net agricultural productivity, human health, and property damages from increased flood risk, as well as drought and higher than normal temperatures.

By decreasing greenhouse gas pollution through the LCFS and C&T, California will contribute to reduced social costs associated with climate change. By 2025, regulating transportation fuels through the LCFS and C&T is expected to produce significant cumulative benefits, including:

- Savings of \$7.9 billion in social cost of carbon damages
- Reduction of CO<sub>2</sub> equivalent emissions by almost 165 million metric tons