



THE ROAD TO CLEAN AIR II – A Zero Emission Future

Public Health and Societal Benefits of a
Zero Emission Vehicle Fleet in California

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I. Introduction: The Need for Cleaner Air and Cleaner Cars

Despite decades of clean air leadership and significant progress in reducing smog and soot, California remains home to some of the most polluted air in America. Over 90 percent of Californians live in areas that fail to meet federal health-protective air quality standards. A leading source of California's air pollution is our transportation sector. California's landmark motor vehicle and fuel standards have helped address the state's air pollution crisis over the last several decades, but there is still far more to do.

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Motor vehicle emissions present both immediate and long lasting threats to public health. Smog and fine particle emissions generated by the combustion of petroleum fuels cause immediate and lifelong respiratory impacts while greenhouse gases emitted today will continue to threaten respiratory health for generations to come. California must use this opportunity to update our clean car standards to ensure a rapid transition from our reliance on dirty fuels and a continuation of our state's national and international leadership in clean air policy.

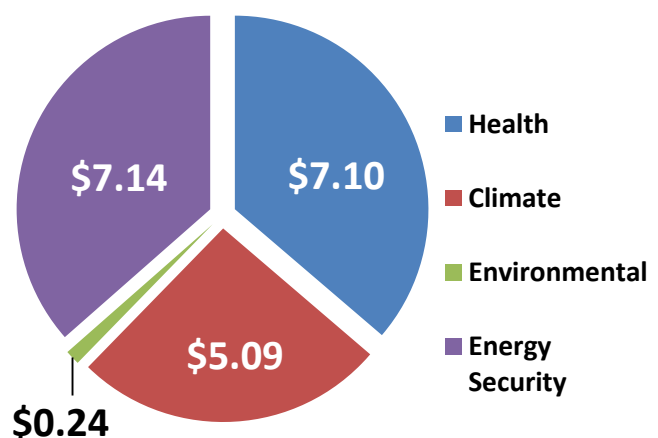
This report builds on the American Lung Association in California's 2011 [Road to Clean Air](#) study that quantified the clean air and public health benefits of moving forward with strong next generation clean car standards in California. By focusing on California's Zero Emission Vehicle program, this new data demonstrates the benefits of enacting a strong advanced technology mandate to cut harmful pollutants in pursuit California's air quality and climate goals.

II. Background: The Road to Clean Air

The American Lung Association in California's *Road to Clean Air* report released in May 2011 evaluated the benefits to public health and the economy by adopting the strongest possible advanced clean car standards, including rules to cut smog, particle pollution and greenhouse gas emissions from vehicles. As California continues to move forward with adopting new standards, this paper focuses on the benefits to Californian's air, health and economy offered by zero emission vehicle technology.

The *Road to Clean Air* utilized the most recent data from the United States Environmental Protection Agency and other state and federal agencies to quantify the health and other societal damages caused by vehicle emissions and fuel consumption in California, in both human health and economic terms. ([Complete report and methodology available online.](#)) The findings show that vehicles meeting current emission standards will cause \$14.5 billion in public health and societal costs annually, including 570 premature

\$19.57 in Damages Caused by the Average Tank of Gasoline under Current CA Vehicle Standards



deaths, over 11,000 asthma attacks and lower respiratory symptoms and 610 respiratory and cardiac hospitalizations for each year on the road. Per gallon consumed, these vehicles will also contribute \$1.19 in health and societal damages. In other words, each full 16.4 gallon tank brings nearly \$20 worth of health and other damages that don't show up on the gas pump.

The findings also show that health and societal costs and health outcomes can be substantially reduced under the next round of clean car standards. According to this analysis, when fully implemented, the advanced clean car standards could achieve the following reductions:

- reduce vehicle greenhouse gas emissions by 45 – 52%
- reduce vehicle smog-forming emissions by 75 – 85%
- reduce petroleum consumption by 38 - 49%
- reduce premature deaths and illnesses by 65 - 75%
- reduce public health, global warming and societal costs by 50 - 56%

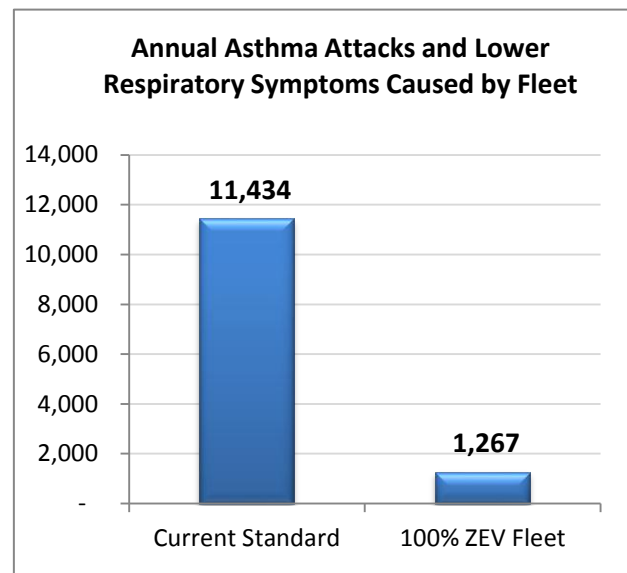
This data demonstrates that strong policies to support the commercialization of advanced technologies that meet the mobility needs of California can also solve the public health, air pollution and climate change crises we are facing. Ramping up California's zero emission vehicle fleet even more and phasing out the state's dependency on petroleum for motor vehicle fuels will achieve even greater benefits.

III. Findings: Zero Emission Vehicles Offer Clean Air, Climate Solutions

This report specifically quantifies the public health, global warming and societal benefits of achieving a complete turnover of the fleet of vehicles on California's roads to a fleet of zero emission vehicles using the methodology outlined in the Road to Clean Air Report. ZEVs are a critical element of the state's clean cars effort and necessary to help meet California's long term air quality and GHG emission reduction goals.

In its [2009 review of the ZEV program](#), the California Air Resources Board researched the role of zero emission vehicles in meeting California's 2050

goal of reducing greenhouse gases by 80% by 2050. CARB modeled 2 possible vehicle scenarios in addition to a business as usual scenario and the role they would play in achieving a "fair share" of the emissions reductions for the passenger vehicle sector needed to achieve this goal. CARB found that a scenario where 100% of new car sales are zero emission vehicles by 2040 is the most likely scenario to reach the 80% goal by 2050.



A pure ZEV fleet that consumes no petroleum would avoid almost \$13 billion in health, climate and other damages and avoid 275 tons per day of criteria air pollutants over a fleet that meets current standards. The ZEV fleet would significantly cut health impacts associated with criteria emissions, including premature deaths, from the new car fleet by 90 percent compared to a fleet only achieving the current standards. A strong ZEV mandate will save lives, cut petroleum dependency and further our state's goals for clean, healthy air.

A fleet of Zero Emission Vehicles in California would reduce the traffic pollution related health impacts by 90 percent compared to today's requirements.

A 100% ZEV fleet in California would result in the following annual and daily benefits as compared to a fleet meeting today's standards:

Overall Benefits of a 100% ZEV Fleet in California

- reduce vehicle greenhouse gas emissions by 73%
- reduce smog-forming and fine particulate emissions by 95%
- reduce petroleum consumption by 100%
- reduce premature deaths and illnesses by 90%
- reduce public health, global warming and societal costs by 90%

Health Damages Avoided Annually by a 100% ZEV Fleet in California

- 510 premature deaths avoided
- 545 respiratory ER visits and cardiac/respiratory hospitalizations avoided
- 10,200 asthma attacks and lower respiratory symptoms avoided
- 230,600 acute and upper respiratory symptoms avoided
- 490 heart attacks avoided
- 48,200 lost work and school days avoided

Total Costs Avoided Annually by a 100% ZEV Fleet in California

- \$13 billion in annual health, global warming and societal costs avoided
- \$4.7 billion in health damages avoided
- \$2.8 billion in climate damages avoided
- \$163 million in environmental damages avoided
- \$5.3 billion in energy security costs avoided

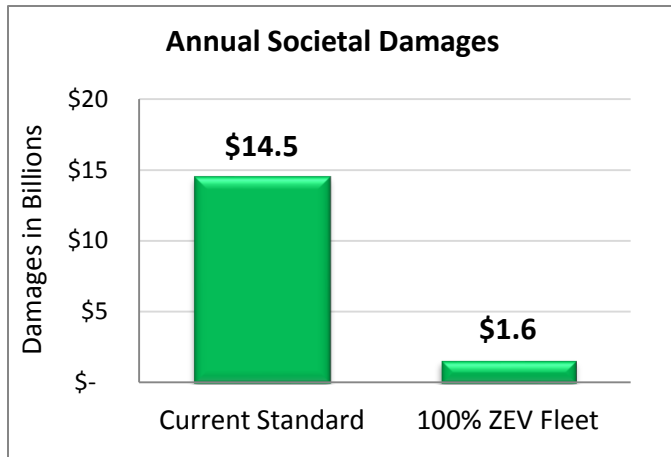
Tons Per Day of Emissions Avoided by a 100% ZEV Fleet in California

- 245,000 tons per day of greenhouse gases
- 258 tons per day of smog-forming gases
 - 141 tons per day of VOC
 - 116 tons per day of NO_x
- 17 tons per day of PM_{2.5}

This analysis illustrates the urgent need to transform our fleet and commercialize zero emission technologies in the shortest possible timeframe. The next round of standards must reflect the urgency of the role that zero emission vehicles will play in carrying out California's clean air and climate goals.

IV. Conclusion: Set California on the Road to Clean Air

California's Zero Emission Vehicle program is critical to successfully reducing the public health burden of air pollution, cutting climate change pollution and commercializing advanced vehicle technologies at the state, national and global levels. The ZEV program is a uniquely California solution to challenges facing the nation and the world and it must be strengthened and supported to ensure success.



CARB's recommendation in the Advanced Clean Cars rulemaking to require almost 1.5 million zero and near-zero emission vehicles by 2025 is critical to ensure California stays on the path toward a full transition to zero emitting technologies. The American Lung Association in California has advocated for a higher number of at least 2 million zero and near-zero emission vehicles in California by 2025 (approximately 20% of new car sales).

CARB must remain focused on achieving the highest possible numbers of zero-emission vehicles on the road over the next fifteen years in order to meet the state's clean air and climate goals and CARB must resist provisions that would erode ZEV obligations on automakers and reduce proposed requirements for producing zero emission vehicles. The American Lung Association in California urges CARB to adopt the strongest possible zero emission vehicle program to ensure the greatest possible achievement of clean air, climate and clean technology benefits.

The American Lung Association in California

saves lives and improves the health of Californians and their lungs. Through research, education and advocacy, we fight to reduce smoking, keep the air we breathe clean, prevent and treat lung diseases such as asthma and COPD, and eliminate lung cancer.