

## UPDATED INFORMATIVE DIGEST

### ADOPTION OF REGULATIONS TO CONTROL GREENHOUSE GAS EMISSIONS FROM NEW MOTOR VEHICLES

**Sections Affected:** Adoption of section 1961.1, title 13, California Code of Regulations and incorporated test procedures, and amendments to sections 1900, 1961 and the incorporated "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles" as last amended May 28, 2004.

**Background:** The State of California has traditionally been a pioneer in efforts to reduce air pollution, dating back to 1963 when the California New Motor Vehicle Pollution Control Board adopted the nation's first motor vehicle emission standards. California likewise has a long history of actions undertaken in response to the threat posed by climate change.

The earth's climate is changing because human activities are altering the chemical composition of the atmosphere through the buildup of greenhouse gases (GHGs), primarily carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and hydrofluorocarbons (HFC). The heat-trapping property of GHGs is undisputed. Although there is uncertainty about exactly how and when the Earth's climate will respond to increasing concentrations of GHGs, observations indicate that detectable changes are under way. There most likely are and will continue to be changes in temperature and precipitation, soil moisture, and sea level, all of which could have significant adverse effects on many ecological systems, as well as on human health and the economy.

Climate is a central factor in California life. It is at least partially responsible for the State's rapid population growth in the past 50 years, and largely responsible for the success of industries such as agriculture and tourism. The potential effects of climate change on California have been widely discussed from a variety of perspectives. The signs of a global warming trend continue to become more evident and much of the scientific debate is now focused on expected rates at which future changes will occur.

Climate change threatens California's public health, water resources, agricultural industry, ecology, and economy. Direct health impacts due to climate change include extreme events, such as heat waves, droughts, increased fire frequency, and increased storm intensity resulting in flooding and landslides. Secondary or indirect health effects include damages to infrastructure causing, for example, sanitation and water treatment problems leading to an increase in water-borne infections. Air quality impacts such as increases in ground-level ozone due to higher temperatures may also cause secondary health impacts. Poor and immigrant populations (who often reside in urban areas where the heat island effect actually increases warming and the consequent effects of heat) are more

vulnerable to climate change as they are often without adequate resources to control their personal environment with appliances such as air conditioners, or to seek medical attention. Thus, these communities are the first to experience negative climate change impacts like heat death and illness, respiratory illness, infectious disease, and economic and cultural displacement.

Water resources in drier climates, such as California, tend to be more sensitive to climate changes. Because evaporation is likely to increase in a warmer climate, it could result in lower river flows and lake levels, particularly in the summer. If stream flow and lake levels drop, groundwater also could be reduced. The seasonal pattern of runoff into California's reservoirs could be susceptible to climatic warming. Winter runoff most likely would increase, while spring and summer runoff would decrease. This shift could be problematic, because the existing reservoirs are not large enough to store the increased winter flows for release in the summer.

As California's water resource systems face challenges from climate change and variability, so too do the State's agricultural sectors. While agricultural production is potentially vulnerable to climate change risks associated with adverse water system impacts, this sector also faces other risks that come with increasingly unpredictable variations in both temperature and precipitation.

Climate change could also have an impact on many of California's species and ecosystems. Species differ significantly in their abilities to disperse and to become established in new locations with more suitable climates. With changes in climate, the extent of forested areas in California could also change. Hotter, drier weather could increase the frequency and intensity of wildfires, threatening both property and forests. Along the Sierra, drier conditions could reduce the range and productivity of conifer and oak forests. Farther north and along the northern coast, drier conditions could reduce growth of the Douglas fir and redwood forests. A significant increase in the extent of grasslands and chaparral throughout the State could result. These changes would affect the character of California forests and the activities that depend on them.

In 2002, recognizing that global warming would impose compelling and extraordinary impacts on California, the legislature adopted and the Governor signed Chapter 200, Statutes of 2002 (AB 1493, Pavley). Chapter 200 directs the Board to adopt regulations that achieve the maximum feasible and cost effective reduction of greenhouse gas emissions from motor vehicles.

**Description of the Regulatory Action:**

Vehicle climate change emissions comprise four main elements: (1) CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions resulting directly from operation of the vehicle, (2) CO<sub>2</sub> emissions resulting from operating the air conditioning (AC) system (indirect AC emissions), (3) refrigerant emissions from the air conditioning system due to

either leakage, losses during recharging, or release from scrappage of the vehicle at end of life (direct AC emissions), and (4) upstream emissions associated with the production of the fuel used by the vehicle. The climate change emission standard incorporates all of these elements.

Under the regulation one manufacturer fleet average emission standard is established for passenger cars and the lightest trucks (PC and LDT1), and a separate manufacturer fleet average emission standard is established for heavier trucks (LDT2). The regulation takes effect on January 1, 2006 and sets near-term emission standards, phased in from 2009 through 2012, and mid-term emission standards, phased in from 2013 through 2016. Staff has identified a number of cost-effective technologies that are available to reduce motor vehicle greenhouse gas emissions sufficient to allow compliance with the proposed standards. Manufacturers can choose the mix of technologies that they employ, provided that the sales-weighted average emissions from their fleet meet the standards noted below. The standards are expressed in terms of CO<sub>2</sub>-equivalent grams per mile, which means that emissions of the various greenhouse gases are weighted to take into account their differing impact on climate change.

The standards are as follows:

Year	Category		Standard CO <sub>2</sub> -eq g/mi	
2009	PC/LDT1	Near-term phase-in	323	
	LDT2		439	
2010	PC/LDT1		301	
	LDT2		420	
2011	PC/LDT1		267	
	LDT2		390	
2012	PC/LDT1		233	
	LDT2		361	
2013	PC/LDT1		Mid-term phase-in	227
	LDT2			355
2014	PC/LDT1			222
	LDT2			350
2015	PC/LDT1	213		
	LDT2	341		
2016	PC/LDT1	205		
	LDT2	332		

To maintain simplicity, the regulation uses the upstream emissions for vehicles that use conventional fuels as a “baseline” against which to compare the relative merits of alternative fuel vehicles. Therefore, the emissions standards as shown above do not directly reflect upstream emissions. Rather, when certifying gasoline or diesel-fuel vehicles manufacturers will report only the “direct,” or “on vehicle” emissions. For alternative fuel vehicles, exhaust CO<sub>2</sub> emission values will be adjusted in order to compensate for the differences in upstream emissions. This approach simplifies the regulatory treatment of gasoline

vehicles, while at the same time allowing for appropriate treatment of alternative fuel vehicles.

Early Credits. AB 1493 directs that emission reduction credits be granted for any reductions in greenhouse gas emissions achieved prior to the operative date of the regulations. Under the regulation, credit for early emission reductions is available for model years 2000 through 2008, and the baseline against which manufacturer emissions are measured is the fully phased-in near term standards (the model year 2012 standards).

Alternative Compliance. AB 1493 requires that the regulations “provide flexibility, to the maximum extent feasible consistent with this section, in the means by which a person subject to the regulations ... may comply with the regulations. That flexibility shall include, but is not limited to, authorization for a person to use alternative methods of compliance with the regulations.” Thus the use of alternative compliance strategies must not undercut the primary purpose of the regulation, which is to achieve greenhouse gas reductions from motor vehicles. Accordingly, the alternative compliance program is limited to the vehicles that are regulated through AB 1493 and their fuels. The major features of the alternative compliance program are:

- Projects must be located in California to be eligible as alternative methods of compliance.
- Only companies regulated by AB 1493 (automakers) will be permitted to apply for alternative compliance credits.
- Only those vehicles regulated under AB 1493 are eligible for alternative compliance credits. This includes model year 2009 and later passenger vehicles and light-duty trucks and other vehicles used for noncommercial personal transportation in California.
- Eligible projects are limited to those that achieve greenhouse gas reductions through documented increased use of alternative fuels in eligible vehicles.

**Comparable Federal Regulations:** There are no comparable federal regulations that control greenhouse gas emissions from new motor vehicles.

Chapter 200, Statutes of 2002 (AB 1493, Pavley), which directed the Board to adopt these regulations, provided that “If the federal government adopts a standard regulating a greenhouse gas from new motor vehicles that the state board determines is in a substantially similar timeframe, and of equivalent or greater effectiveness as the regulations that would be adopted pursuant to this section, the state board may elect not to adopt a standard on any greenhouse gas included in the federal standard.” To date no such federal standards have been proposed.