



CALIFORNIA
NATURAL GAS VEHICLE
PARTNERSHIP

GUIDING PRINCIPLES

OUR COMMITMENT TO COST-EFFECTIVELY
ADDRESSING CALIFORNIA'S AIR QUALITY
AND CLIMATE PROTECTION GOALS

40%

Reduction in
greenhouse gas
emissions by

2030
(SB 32)

80%

Reduction in
greenhouse
gases by

2050
(EO B-16-2012)

80%

Reduction in
mobile NOx emissions in the
South Coast Air Basin by

2031
(CARB 2016 Mobile Source Strategy)

www.cngvp.org

Improving California's air quality is critical for public health and NAAQS attainment.



Although California leads the nation in setting aggressive and effective emissions standards for vehicles, more than 88% of Californians (35 million people) still live in areas that do not meet U.S. EPA's National Ambient Air Quality Standards (NAAQS).¹

To address this issue, CNGVP members have developed
10 guiding principles
to lead our stakeholder outreach and education efforts.

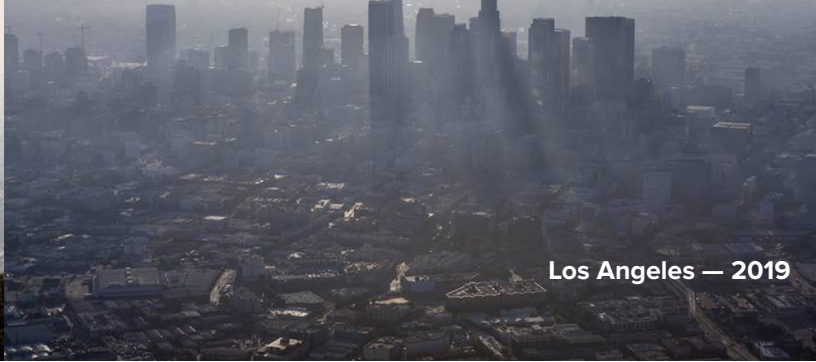


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California has made great strides in improving air quality throughout the state, but continues to be challenged by unhealthy air.



Los Angeles — 1995



Los Angeles — 2019

Left photo: Los Angeles Metro Library Archive, Right photo: Tree Hugger Media

35 million

Californians live in cities and towns with unhealthy air²

1

Air Pollution Impacting Public Health

Air pollution presents serious immediate health impacts to California residents, especially to those living in disadvantaged communities.

Living in areas with poor air quality—such as areas along major freeways and freight corridors—increases the risk of many adverse health outcomes including: lost school and work days, lung and heart disease, birth defects, and premature death.

50%

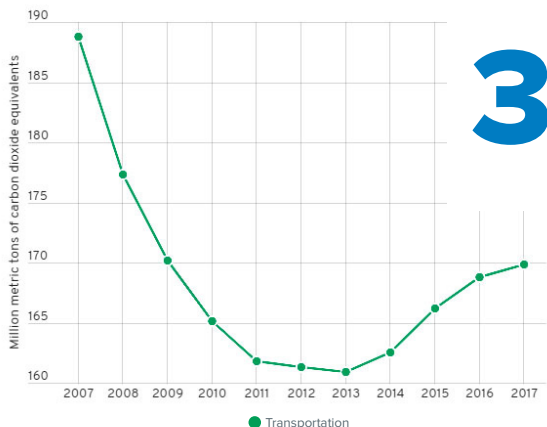
of smog-precursor emissions in California come from on-road HDVs³

2

Commercial Trucks are a Major Source of Air Pollution

Existing heavy-duty diesel trucks are some of the most significant contributors to harmful air pollution in California. The reduction of diesel exhaust emissions presents one of the best opportunities to protect human health in California.

California's air quality agencies have indicated that achieving existing, health-based ambient air standards will require the rapid, large-scale replacement of heavy-duty diesel vehicles with equipment that meets, or exceeds CARB's most stringent, optional low-NOx emissions standard (i.e. 0.02 g/bhp-hr NOx).⁵



3

GHG Emissions on the Rise

Greenhouse gas (GHG) emissions from transportation are currently rising in California.⁴

While the state's total GHG inventory continues to decrease, GHG emissions from transportation have increased. The transportation sector remains the largest source of GHG emissions in the state, accounting for 40% of statewide emissions in 2017⁴. Reducing transportation GHG emissions is necessary to achieve California's existing climate action mandate, including meeting GHG emission reductions mandated in SB 32.

1: US EPA, Nonattainment Areas for Criteria Pollutants, "Green Book" 2019. <https://www.epa.gov/green-book>

2: American Lung Association, "State of the Air" Report 2019. https://www.lung.org/local-content/_content-items/about-us/media/press-releases/20th-sota-ca.html

3: Game Changer Report, April 2016. https://ngvgamechanger.com/pdfs/GameChanger_FullReport.pdf

4: California Air Resources Board, 2017. https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2017/ghg_inventory_trends_00-17.pdf



4 A Growing Climate Crisis

California is increasingly impacted by the growing climate crisis. Immediate and aggressive action is needed and required by state law.

California is experiencing the impact of climate change now. California's coastal sea levels are rising, threatening people, property, and infrastructure. The state's critical snowpack, which supports California's water supply, is melting earlier and all at once. Higher temperatures and extreme heat days across the state are stressing California's aging electricity grid and fueling wildfires which start earlier, last longer, and burn more intensely than they have in decades.⁶

5 Targeting Methane Emissions

The immediate reduction of fugitive methane emissions is necessary to rapidly reduce the impacts of climate change.

About 25% of man-made global warming is caused by methane emissions. Methane has up to 87 times the global warming potential of CO₂ in the first twenty years after its release.⁷ Nearly 50% of methane emissions in California come from organic waste decomposing in landfills and livestock manure. Both sources of methane could be captured and converted into renewable natural gas and other transportation fuels, as well as used in industrial applications and decarbonizing buildings⁸. Additionally, robust maintenance and monitoring systems are necessary to limit methane leakage.

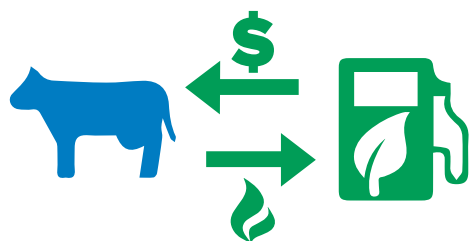
84-87x

the global warming potential of CO₂ over 20 years

6 Maximizing Co-Benefits

California's climate policies and incentives should drive maximum environmental impact while ensuring that businesses in the state can continue to thrive.

California has the opportunity to fund projects that enable the state to address multiple policy objectives while offering new revenue streams to businesses (e.g., capturing methane from dairy manure and converting it into renewable natural gas that can be sold as an ultra-low carbon transportation fuel or used to produce hydrogen or electricity, and providing revenue back to the dairy family to offset the costs of methane capture).



5: South Coast Air Quality Management District, Air Quality Management Plan: Chapter 4, 2016. <http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016>

6: State of California, Department of Justice, 2019. <https://oag.ca.gov/environment/impact>

7: US EPA, Global Warming Potentials, 2019. <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials>

8: California Air Resources Board, 2017. <https://ww3.arb.ca.gov/cc/inventory/background/ch4.htm>

Diverse requirements



7 No One Technology Fits All

There is currently no "one size fits all" vehicle technology that will meet the needs of all California on-road fleet operators.

California's fleet operators—including transit, delivery, goods movement, agriculture, construction, schools, utilities, refuse collection, and public works—have a diverse set of operating conditions that require a diverse set of transportation solutions.

987,817
Registered

medium and heavy-duty
vehicles in California

8 Limited Funding Dollars

California does not have the means to publicly fund the replacement of every medium- and heavy-duty vehicle in the state.

The available public funding assistance intended to facilitate a transition to cleaner transportation technologies is inadequate to achieve existing emission reduction mandates on its own (e.g., existing federal, state, and local vehicle replacement grant and rebate programs). It will require a combination of incentives, regulations, and other innovative strategies to help transform California's heavy-duty vehicle fleet.



9 Supporting Cost-Effective and Transformational Technology Solutions

It is critical to maximize cost-effective emission reductions in the near-term while reducing the cost of early stage advanced technologies in the long-term.

A portfolio of near-zero and zero-emission vehicle technologies will all play important roles in California's clean transportation future. This approach will help maximize cost-effective emission reductions in the near-term, as well as reduce the cost of earlier stage advanced vehicle technologies for greater emission reductions in the long-term. Advanced vehicle technology costs vary by manufacturer, model, and fuel type. Additionally, different technologies are at different stages of commercialization. Some technologies are commercially available today while some are still in the development and testing stage.



10 Spurring Innovation

Market competition among transportation technology solution providers leads to improved operational, environmental, and cost performance.

Promoting competition within the marketplace would accelerate technology innovation, performance, and cost reductions.

Natural gas vehicles (NGVs) are ultra-clean and commercially available today.



**Certified
by CARB**
(.02 g/bhp-hr NOx)

90% cleaner than the U.S. EPA's 2010+ heavy-duty NOx emissions standard (.02 g/bhp-hr NOx)

600+
Miles

of range on a full tank

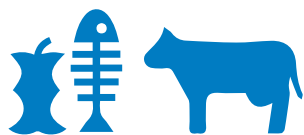
150,000+
NGVs

Successfully operating in commercial fleet applications across the U.S.—including trucks, buses, shuttles and vans

**AVAILABLE
NOW**

Low NOx certified medium- and heavy-duty NGVs are available now from many OEMs with established sales and service networks

Renewable natural gas (RNG) is a low-cost fuel and interchangeable with conventional natural gas.



RNG is produced from food and green waste, livestock manure, wastewater, agricultural waste and other organic waste sources. In-state production is increasing year-over-year.



RNG can be a carbon NEGATIVE transportation fuel, with some projects in California providing well-to-wheel GHG reductions up to 382% compared to petroleum-based ultra-low sulfur diesel

139
Million DGE
of RNG

At the end of 2019, 139.3 million diesel gallon equivalent (DGE) of RNG was consumed by California motor vehicles



Widely available and sold at retailers nationwide.

Investing in RNG supports a future with lower-carbon electricity generation and renewable hydrogen production.



Renewable hydrogen can be used to generate heat and power in fuel cells, as a transportation fuel, or as a feedstock for RNG production.



Power-to-Gas (P2G) technology harvests excess nuclear, wind, and solar power, which would otherwise be wasted, helping to produce RNG without creating GHG emissions.