

SENATE SELECT COMMITTEE ON CLIMATE CHANGE & AB 32 IMPLEMENTATION

INFORMATIONAL AND OVERSIGHT HEARING

California Climate Progress Update:
Building Resilient Communities, Cutting Pollution and Creating Jobs

UCLA School of Law

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Summary Report and Issues for Further Consideration

An increasingly refined scientific consensus concludes that the unprecedented brutality and cost of today's climate is not natural.¹ Adverse impacts to the health, safety and welfare of Californians are on pace to worsen dramatically if current climate pollution rates continue unabated. At these emissions rates, tipping points for irreversible climate forcings could be breached in the coming decades (e.g. methane releases from Arctic permafrost).² But California, given its spending power, export markets for innovative technology, and international policy influence, can take immediate and long-term steps to avert the worst impacts of climate change globally, and safeguard our economy and our environment locally.

At a recent hearing of the Senate Select Committee on Climate Change and AB 32 Implementation, Senators Pavley (Chair), Correa, de León, DeSaulnier and Lieu and Assemblymember Bloom (ex officio observer) explored the ramifications of climate change for California's health, safety, and welfare with Dr. Alex Hall, Professor in the UCLA Department of Atmospheric and Oceanic Sciences. The Committee then examined the status of California's actions to reduce statewide greenhouse gas emissions to 1990 levels by 2020 under AB 32 with Dr. Steven Cliff, Assistant Chief of the Stationary Source Division of the California Air Resources Board. Finally, the Committee considered a variety of policy solutions and investment opportunities that could enhance California's economic competitiveness while reducing climate pollution in a manner that improves public health in our most disadvantaged communities.

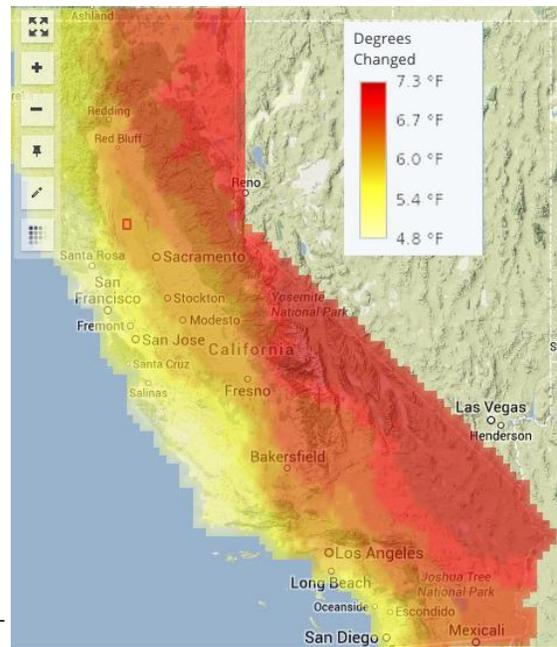
The following report offers members an analysis of issues raised during this hearing, and questions to consider for future proceedings in 2014.

I. High-Risk Future for California

Recent “snapshots” of climate conditions in California at current emissions rates show “bigger and more intense wildfires, floods, storms, and heat waves are already occurring and are likely to become more frequent and more severe.”³

Inland areas, as noted in Dr. Alex Hall’s testimony to the Committee, could be drier, hotter, more polluted places to live in the decades ahead if a business as usual approach to energy and land use persists. Hall’s research projects that Southern California could see average daily temperatures increase by 4.6 degrees by mid-century and 8.2 degrees by the end of the century, with more dramatic increases inland than in coastal areas.⁴ As a result, summer wildfires—like the Station Fire of 2009, which burned 160,577 acres north of Los Angeles and killed two firefighters, and the Rim Fire of 2013, which cost the state about \$1 billion—will become the norm.⁵

Projected Degrees of Change in Average Annual Temperature during 21st Century
(High Emissions Scenario, cal-adapt.org)



Statewide impacts of other extreme weather events could have even more devastating effects. According to the California Resources Agency’s 2013 draft update to the state climate adaptation strategy, a single winter super-storm could inflict \$725 billion in damage to the state.⁶

While carbon dioxide is the primary driver of long-term warming trends that will lead to increasingly extreme weather events, short-lived climate pollutants (SLCPs) like methane and black carbon also significantly degrade ambient air quality, adversely impacting public health in the near-term, especially in disadvantaged communities. The five cities with the most polluted air in America are in California.⁷ The South Coast and San Joaquin Air Basins are both in nonattainment with the state and federal clean air laws for ozone and small particulate matter (PM_{2.5}). South Coast is also a nonattainment area for nitrogen oxide (NO_x) emissions.⁸ The annual cost of this air pollution, due to healthcare costs, premature deaths, lost economic activity, and other factors, is about \$22 billion for South Coast, and \$6 billion for San Joaquin Valley.⁹

Much of this air pollution, especially ozone and particulate matter, is caused by SLCPs. Methane, a precursor to ozone pollution and a growing threat to air quality and climate stability, is inadequately accounted for in current statewide emissions inventories.¹⁰ Black carbon, a component of soot, is a rapid climate forcing agent, which traps heat in the atmosphere for a period of days or weeks, and also contributes to respiratory and other diseases.¹¹ Rapid action to reduce these unique types of pollution can have both local and global benefits.¹²

Between AB 32 and the Clean Air Act, California already has extensive legal authority to take aggressive action to reduce SLCPs. The State Air Resources Board (ARB) projects 95

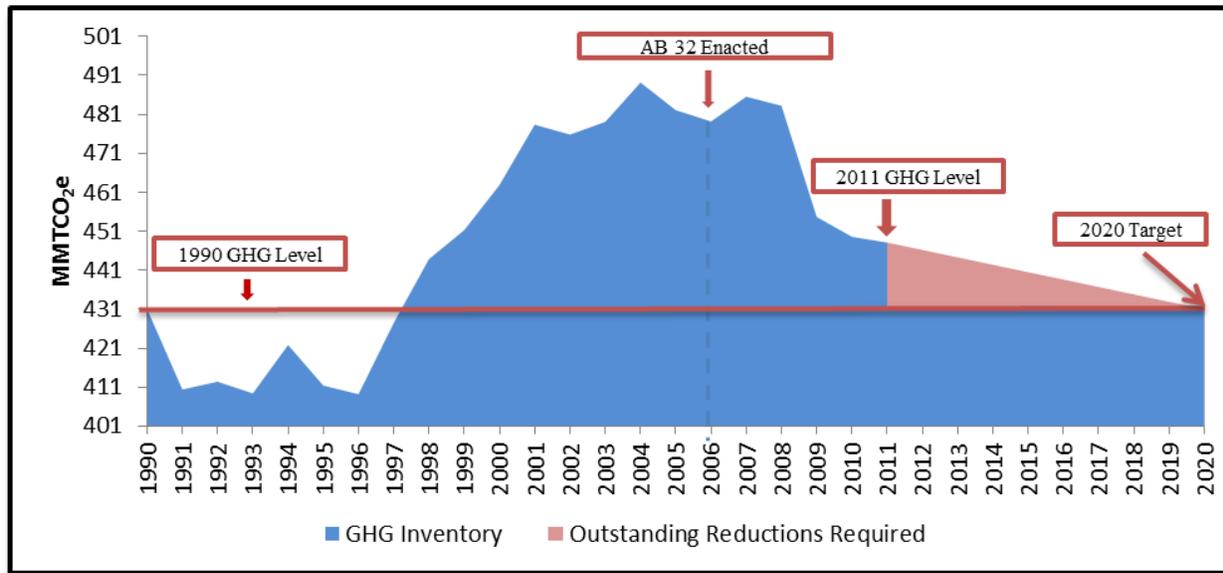
percent control of anthropogenic black carbon emissions by 2020 due to existing policies and regulations.¹³ Current regulations to address black carbon include ARB’s truck and bus regulation,¹⁴ and regulations for at-berth ocean vessels in California ports.¹⁵

In its draft Scoping Plan Update, which will be revised in late January 2014, ARB stated it will “develop a short lived climate pollutants strategy by 2016 that will include an inventory of sources and emissions.”¹⁶ A two-year bill pending in the Assembly, SB 605 (Lara), would require ARB to recommend additional SLCP measures and actions to be “implemented” before 2016, “to achieve the maximum, technologically feasible, and cost-effective reductions.”

II. AB 32 on Track to 2020—Long-Term Risks to Health and Welfare Remain

ARB’s Dr. Steve Cliff noted that the outstanding pollution reductions (17.11 MMT CO₂e) required by AB 32 by 2020 are on track to be achieved in a cost-effective manner using existing technologies. California has currently reduced 31.07 MMT CO₂e emissions, approximately 64 percent of the reductions required to satisfy the requirements of AB 32.¹⁷

Greenhouse Gas Emissions Reductions Required by 2020 under AB 32



California is seeing new interest from partners beyond its borders to cooperate and collaborate utilizing various aspects of the AB 32 model. California is party to international agreements with Australia, Brazil, Mexico, Indonesia, and China to facilitate interagency climate cooperation; the Pacific Coast Action Plan on Climate and Energy—along with Oregon, Washington, and British Columbia—to facilitate the establishment of a west coast price on carbon, among other climate goals; and an eight-state plan to deploy 3.3 million zero emission vehicles by 2025.¹⁸

The Committee may wish to consider what legislative actions should be taken to direct and inform executive efforts to encourage other large jurisdictions and U.S. states to take climate actions similar to those being pursued under AB 32, including but not limited to, the

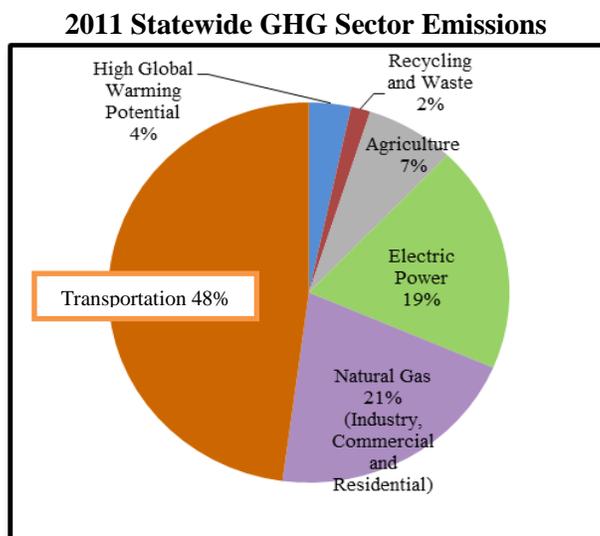
reduction of methane emissions (e.g. the Global Methane Initiative) and pending federal Clean Air Act regulations to limit carbon dioxide emissions from power plants and oil refineries.

While California’s near term climate pollution reduction goals appear to be readily achievable, deep reductions in emissions may require significant technological innovation. In his testimony, Dr. Hall noted that during the mid-century (2041-2060), temperature changes in the modeled mitigation scenario are approximately 70 percent of those in the “business as usual” scenario model, indicating that significant effects are inevitable.¹⁹ Dr. Hall noted the dual need for technological innovation in the long-term and climate pollution reductions that will take effect in the near-term. State agencies and independent organizations have also concluded that additional innovation is needed to achieve necessary long-term greenhouse gas emissions.²⁰ The State Implementation Plan for meeting the National Ambient Air Quality Standards under the Clean Air Act also relies heavily on still-undeveloped technologies, known as “black box” measures.²¹ These measures are needed because adopted rules and programs remain insufficient to achieve attainment with current air quality attainment standards. Even after accounting for existing rules and programs, for example, the South Coast region needs to cut regional NO_x emissions by an additional two-thirds by 2023, and ozone by three-quarters by 2032 to meet federal targets.

The Committee may wish to consider how current state funding and governance models are advancing technological innovation to meet California’s climate and air quality demands in the next 10 – 20 years, taking into consideration other innovation models (e.g. U.S. Department of Energy’s Advanced Research Projects Agency-Energy (ARPA-E) and Alberta’s Climate Change and Emissions Management Corporation).

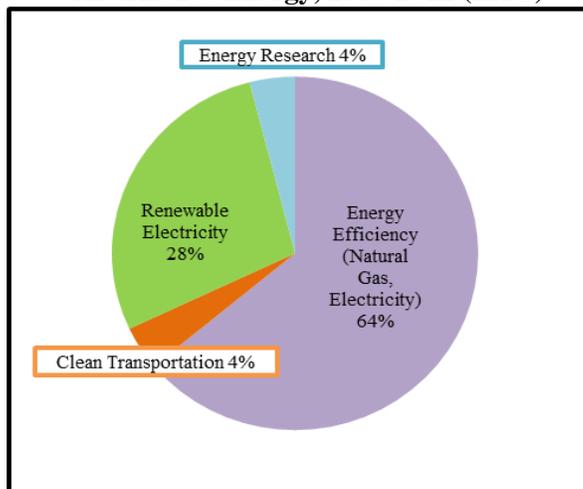
III. The Transportation Gap in California Climate Policy

The primary climate change culprit in California is the petroleum dependency of its transportation system. About half of all statewide greenhouse gas emissions come from producing and combusting transportation fuels, and California ranks third in worldwide petroleum consumption after China and the United States.²² While California is one of the largest and most efficient industrialized economies in the world, the state’s transportation sector is second only to Texas’s electric power sector in terms of overall greenhouse gas pollution nationwide.²³ This stands in sharp contrast to California’s power sector, which emits 36 percent less pollution for each kilowatt-hour of electricity used than the nationwide average—about 40 percent of the carbon pollution produced by the Texas power sector overall, while supporting a 43 percent larger economy.²⁴



Despite the climate pollution challenge for California’s transportation sector, the Legislative Analyst’s Office found that only four percent of about \$16 billion invested over the last 30 years has targeted low carbon transportation. The electricity and natural gas sectors have reaped the lion’s share of public investment (92 percent).²⁵

State Investment in Efficiency and Alternative Energy, 1979-2012 (LAO)



This underinvestment trend holds for overall transportation infrastructure investment as well. The California Transportation Commission estimates that state transportation infrastructure faces about a \$300 billion shortfall over the next 10 years over and above what is currently available to maintain and preserve state highways, transit, ports, streets and roads.²⁶

Traditional sources of funding for transportation infrastructure do not appear to be reliable in the years ahead.²⁷ Meanwhile, limitations persist at the local level, including the dissolution of regional development authorities, limitations on the use of property tax increment revenues to finance the implementation of local transportation and land use plans, and continued fiscal challenges for many cities and counties.

In his testimony, Dr. Cliff of ARB noted that the major gap in the state’s implementation of AB 32 is that petroleum-based fuels that power our transportation system remain uncapped. Stationary sources have been subject to a declining cap since January 2013, while also receiving billions of dollars in private capital and ratepayer investment in efficiency, renewable energy, and other greenhouse gas reduction strategies. Oil companies selling petroleum in California, however, will not be subject to similar obligations until 2015. While the private sector has already made major strides in advancing zero emissions vehicles, alternative fuels, and sustainable transportation and land use planning, the state has consistently underfunded clean transportation.

The Committee may wish to examine the total amount of unmet clean transportation needs, and what role proceeds from the auctioning of California Carbon Allowances, relative to other funding sources, can play in fulfilling unmet need.

IV. The Legal, Economic and Environmental Urgency of Investing Auction Proceeds

AB 32 is silent on how best to invest the proceeds resulting from implementation of the primary market-based compliance mechanism required by the law. However, investment of these revenues is critical to meet long-term greenhouse gas reduction goals and strengthen California’s economy. According to a December 2013 report by ICF International, investing AB 32 proceeds in greenhouse gas reductions (e.g. energy efficiency, clean transportation) will create up to 91,000 more jobs than loaning monies from this special fund to the state’s general fund.²⁸

Investments of the proceeds that further the regulatory purposes of AB 32 and exhibit a strong nexus to greenhouse gas emissions reduction will also bolster the legal standing of AB 32. In November 2013, Judge Frawley of the Sacramento Superior Court held in related cases, *California Chamber of Commerce v. ARB* and *Morning Star Packing Company v. ARB*, that ARB's decision to auction allowances under the cap and trade program is not illegal or unconstitutional as its primary purpose is not to raise general tax revenue, and instead constitutes the valid imposition of a regulatory "mitigation" fee or charge.²⁹ As Cara Horowitz, Professor of law at UCLA, noted in her testimony, expenditure of proceeds in accordance with this holding and the requirements of AB 32, AB 1532 (J.A. Pérez, 2012), and SB 535 (de León, 2012) would provide further evidence in the pending appeals of these cases of the legality and regulatory necessity of auctioning allowances and directly investing proceeds collected in the Greenhouse Gas Reduction Fund.

The Cap-and-Trade Auction Proceeds Investment Plan, released in May 2013, provides a framework for the investment of AB 32 revenues. The Plan was adopted pursuant to AB 1532 (J.A. Pérez, 2012) and SB 535 (de León 2012), which requires that 25 percent of the auction proceeds be spent on projects that benefit disadvantaged communities. The Plan takes into account criteria such as maximizing economic, environmental, and public health benefits, in addition to input from a large group of stakeholders. In accordance with AB 1532, the Plan identifies four key areas of potential investment: (1) low carbon transportation and infrastructure, (2) strategic planning for sustainable infrastructure, (3) energy efficiency and clean energy, and (4) natural resources and solid waste diversion.

Testimony to the Committee from the Los Angeles Economic Development Corporation, the California State Association of Counties, the Coalition for Clean Air, and the California Alliance for Jobs emphasized the wide variety of sound, shovel-ready investments in each of these categories.

The Committee may wish to consider what metrics could be used to evaluate the efficacy of various types of investments in the short and long term, as well as the performance of such investments in promoting greenhouse gas reductions, with co-benefits such as economic development, job creation, reductions of co-pollutants, and technological innovation.

Sources Cited

- ¹ Since the beginning of human civilization up until about 200 years ago, our atmosphere contained about 275 parts per million of carbon dioxide. Last year, concentrations exceeded 400 parts per million for the first time in human history. This spike makes it “extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century.” Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley, eds., *Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press, 2013), “[Summary for Policymakers](#),” 15.
- ² Timothy M. Lenton, Hermann Held, Elmar Kriegler, et al., “[Tipping Elements in the Earth’s Climate System](#),” *Proceedings of the National Academy of Sciences of the United States of America* 105 (February 2008): 1786-1793.
- ³ California Natural Resources Agency, [Safeguarding California: Reducing Climate Risk](#) (December 2013), 5. The Resources Agency’s Cal-Adapt tool provides visualizations for other local climate impacts besides temperature increases, like precipitation, sea level rise, and snowpack ([cal-adapt.org](#)).
- ⁴ The number of annual days higher than 95 degrees will likely increase ten-fold in certain areas in the Southern California region, such as Irvine and Los Angeles. Alex Hall, et al., Climate Change LA, [Mid-Century Warming in the Los Angeles Region](#) (June 2012).
- ⁵ FEMA estimates \$127 million for total fire suppression costs, while a study commissioned by the San Francisco Public Utilities Commission estimates a \$736 million environmental benefits loss. Interagency All-Risk Incident Information Management System, [InciWeb: Rim Fire](#) (October 2013). David Batker, Zachary Christin, Rowan Schmidt, Isabel de la Torre, [Preliminary Assessment: The Economic Impact of the 2013 Rim Fire on Natural Lands](#) (Tacoma, WA: Earth Economics, 2013). Since 2003, the federal government has spent \$4 billion dollars fighting fires on federal land in California. Alyson Kenward, Urooj Raja, “[Nearly Half of All Western Wildfire Costs Go To California](#),” *Climate Central*, August 28, 2013.
- ⁶ [Safeguarding California at 25](#).
- ⁷ Bakersfield and Merced are tied for first, followed by Fresno-Madera, Hanford-Corcoran, and a four-way tie between Los Angeles, Long Beach, Riverside and Visalia. American Lung Association, [State of the Air 2013: Most Polluted Cities](#) (April 2013).
- ⁸ California Air Pollution Control Officers’ Association, [California’s Progress Toward Clean Air](#) (April 2013), 19.
- ⁹ Jane V. Hall, Victor Brajer, and Frederick W. Lurmann, [The Benefits of Meeting Federal Clean Air Standards in the South Coast and San Joaquin Valley Air Basins](#) (Fullerton, CA: California State University, 2008), 5; John A. Romley, Andrew Hackbarth, Dana P. Goldman, [The Impact of Air Quality on Hospital Spending](#) (Santa Monica, CA: RAND Corporation, 2010), 15 (noting that taxpayer-funded Medicare and Medi-Cal shoulders about two-thirds of the costs—\$197 million from 2005-2007).
- ¹⁰ According to the State Board, total methane emissions are likely 1.3 to 1.7 times higher than estimated in the official statewide GHG emission inventory. California Air Resources Board, [Climate Change Scoping Plan First Update](#) (October 2013), 17.

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- ¹¹ Reduction of black carbon regionally, for example, can lead to global cooling. V. Ramanathan, et al., [*Black Carbon and the Regional Climate of California*](#) (April 2013), 19.
- ¹² For general background on short-lived climate pollutants, see the background memo prepared by the Senate Select Committee on Climate change & AB 32 Implementation, [*Climate Impacts in California and Update on AB 32 Implementation*](#) (May 2013), 5-6.
- ¹³ [*Climate Change Scoping Plan First Update at 14*](#). According to a recent 3-year study on black carbon, ARB regulations, particularly those governing diesel engines, have reduced 21 MMT CO₂e annually. [Ramanathan at 19](#).
- ¹⁴ The truck and bus rule requires older heavy-duty diesel vehicles and buses to be replaced or equipped with a particulate filter by January 1, 2014. California Air Resources Board, [*Truck and Bus Regulation Reporting*](#) (November 2013).
- ¹⁵ The regulation requires that by January 1, 2014 at least 50 percent of a vessel fleet's visit to a port must meet specific diesel engine operation time limits. California Air Resources Board, [*Regulatory Advisory: Ships-At Berth Regulation*](#) (December 2013).
- ¹⁶ [*Climate Change Scoping Plan First Update at 10*](#).
- ¹⁷ California Air Resources Board, [*Statewide GHG Inventory 2000-2011*](#) (August 2013). Note: a less comprehensive inventory based on mandatory reports from entities emitting 10,000 MMT of CO₂e per year or greater shows an increase of approximately two percent for 2012. ARB has yet to update the comprehensive statewide GHG inventory, which includes sources not covered by the mandatory reporting protocol like forestry and agriculture. California Air Resources Board, [*ARB 2008-2012 Emissions for Mandatory Greenhouse Gas Emissions Reporting Summary*](#) (November 2013).
- ¹⁸ California Air Resources Board, [*Memorandum of Understanding between Australia's Clean Energy Regulator and the California Air Resources Board*](#) (July 2013); Governors' Climate and Forests Task Force, [*Memoranda of Understanding with Member States and Provinces*](#) (November 2010); Office of the Governor Edmund G. Brown, [*Memorandum of Understanding Between the State of California and the People's Republic of China*](#) (September 2013); Pacific Coast Collaborative, [*The Pacific Coast Action Plan on Climate and Energy*](#), (October 2013); [*State Zero-Emission Vehicle Programs Memorandum of Understanding*](#) (October 2013) (other signatories include Connecticut, Maryland, Massachusetts, New York, Oregon, Rhode Island and Vermont).
- ¹⁹ [Alex Hall et al. at 20](#).
- ²⁰ Recent studies by both the California Council on Science and Technology and Lawrence Berkeley National Laboratory conclude that the state can only achieve about a 60 percent greenhouse gas emissions reduction below 1990 levels by 2050 through an aggressive expansion of state policies to implement technologies currently in the early stages of development, dramatic increases in the energy efficiency of buildings, industry, and transportation, and major strides to decarbonize the state's electricity and fuel supplies. California Council on Science and Technology Report, [*California's Energy Future—The view to 2050*](#) (May 2011), 31; Jeffrey Greenblatt, [*Estimating Policy-Driven Greenhouse Gas Emissions Trajectories in California: The California Greenhouse Gas Inventory Spreadsheet \(GHGIS\) Model*](#) (Berkeley, CA: Lawrence Berkeley National Laboratory 2013), 28.
- ²¹ California Air Resources Board, [*Vision for Clean Air: A Framework for Air Quality and Climate Planning*](#) (2012), 11.

²² [ARB Statewide GHG Inventory 2000-2011](#) (for purposes of this report, transportation emissions in California include direct refinery emissions and the carbon content of transportation fuels); California Energy Commission, [California Petroleum Statistics & Data](#) and [2012 California Oil Consumption](#); U.S. Energy Information Administration, [2012 World Oil Consumption](#).

²³ [ARB Statewide GHG Inventory 2000-2011](#); [United States Census Bureau, 2010 Census](#); World Resources Institute, [2010 World-wide GHG emissions per capita](#) and [2010 World-wide GHG emissions per GDP](#).

²⁴ In 2012, Texas' electric power sector generated more than 251 MMT CO₂e, while California's total power generated and imported accounted for about 100 MMT. [ARB Mandatory Greenhouse Gas Emissions Reporting Summary, 2008-2012](#). U.S. Environmental Protection Agency, [Air Markets Program Data](#); U.S. Bureau of Economic Analysis, [Real GDP by State](#), 2012; California Energy Commission, [California electricity generation 1983-2012](#); U.S. Energy Information Administration, [U.S. electricity generation 2003-2012](#)).

²⁵ Legislative Analyst's Office, [Energy Efficiency and Alternative Energy Programs](#) (December 2012), 5. The \$683 million of cumulative state clean transportation funding has been sourced from taxpayers and drivers via vehicle registration and pollution fees assessed and distributed under AB 118 (Núñez, 2008; extended and amended by AB 8 (Perea, 2013)) and sales and use tax exemptions granted under SB 71 (Padilla, 2010).

²⁶ The state's pent up need for maintenance and replacement of its aging system and its projected future needs far outstrip the available funding. California Transportation Commission, [Statewide Transportation Needs Assessment](#) (November 2011), 1-3.

²⁷ Proposition 1B funds expired at the end of 2013. Net taxable gasoline gallons have decreased over the past 5 years, resulting in a \$152 million budget shortfall last year (Source: Board of Equalization, [Taxable Gasoline Gallons 10 Year Report](#) (2013)). Due to the 2010 fuel tax swap, the Legislature also now has greater flexibility to use gas tax revenues for general funds, rather than local transportation-related projects (Source: Legislative Analyst's Office, [The 2010-2011 Budget: Achieving General Fund Relief from Transportation Funds](#) (January 2011)).

²⁸ Bansari Saha, Jan Mazurek, Daniel Vickery, ICF International, [Modeling the Economic Impacts of AB 32 Auction Proceeds Investment Opportunities](#) (December 2013).

²⁹ The allowance auctions were held to be a valid regulatory fee and not a tax, *inter alia*, because the following three-pronged test was met: "(1) the "primary purpose (or intended effect) of the fee must be regulation, not revenue generation; (2) the total amount of fees collected cannot exceed the costs of the regulatory activities they support; and (3) there must be a reasonable relationship between the fees charged and the regulatory burden imposed by the fee payers' products or operations." *California Chamber of Commerce, et al. v. California Air Resources Board, et al.*, (Super. Ct. Sacramento County, No. 34-2012-80001313); *Morning Star Packing Co., et al. v. California Air Resources Board, et al.*, (Super. Ct. Sacramento County, No. 34-2013-80001464), [Joint Ruling on Submitted Matters](#) (Aug. 28, 2013), 18.