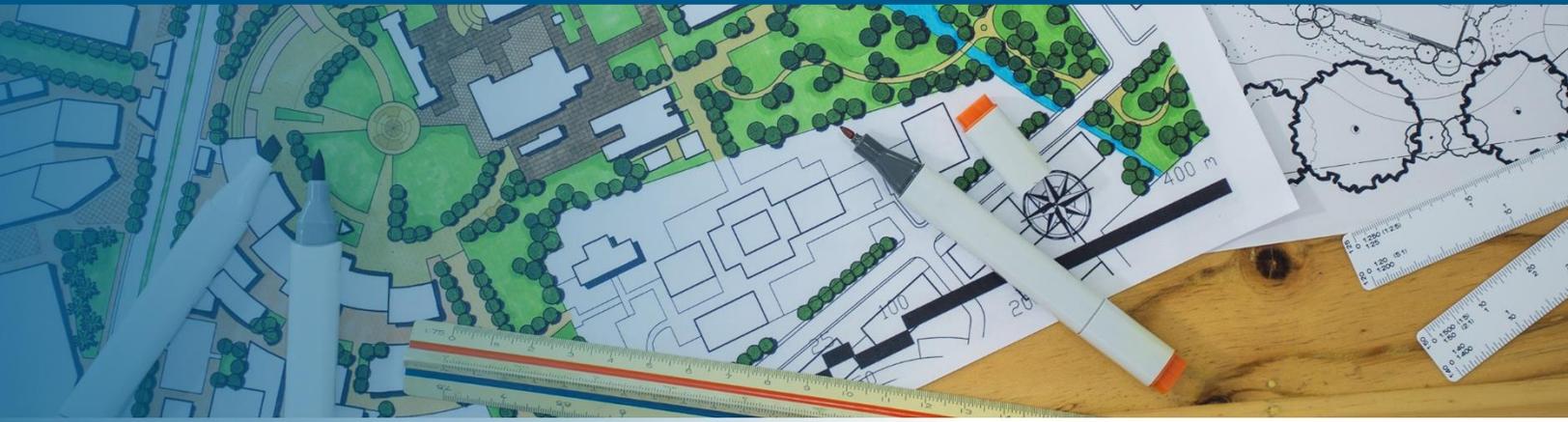


Integrated and Resilient Planning



The Changing Climate

The Earth's climate is dynamic and has shifted over time. However, changes in the global climate have accelerated over the past 50 years due to human activities. Underserved and low-income communities are disproportionately impacted by the effects of climate change, as well as other environmental burdens, including air pollution. Various federal and state regulations have been adopted to reduce greenhouse gas (GHG) emissions, improve environmental justice and social equity, and help communities plan for and adapt to anticipated changes in our climate. Beyond regulation, developers and decisionmakers can build future equity and resilience through informed and holistic project planning.

California is already seeing the effects of climate change on its natural resources, populations, and infrastructure. Major environmental indicators have shifted; since the start of the twentieth century, peak runoff in the Sacramento River now occurs nearly a month earlier, and glaciers in the Sierra Nevada have lost about 70 percent of their area. The state has experienced major climate events in recent years, including a drought from 2012–2016 that heavily affected the agricultural sector and resulted in statewide water conservation efforts, followed by an extremely wet winter in 2016–2017 that caused significant loss of life and damage to infrastructure. The frequency, size, and devastation of wildfires have also

increased: 12 of the 20 largest wildfires (in terms of acres burned) in the state's recorded history occurred between December 2017 and the writing of this Handbook, including five in 2020 and four in 2021 alone (Cal Fire 2021).

As human activities and natural processes continue to increase GHG emissions across the globe, the impacts of climate change are likely to continue and worsen in the future. Specifically, the following climate hazards are projected to occur in California over the next century (Bedsworth, et al. 2018).

- Increase in annual average maximum daily temperature of up to 5.8°F by 2050 and up to 8.8°F by 2100.
- Increase in intensity of atmospheric river events, with northern California experiencing more wet extremes and southern California becoming drier.
- Increase in frequency and intensity of drought.
- Increase in the amount of precipitation falling as rain (instead of snow) and a corresponding decrease in accumulated snowpack.
- Increase in high wildfire risk conditions and projected increase in number of acres burned by wildfire.
- Increase in sea level rise along the coast, ranging from about 0.7 to 2.3 feet, by 2050.

These and other climate hazards will negatively impact public health and infrastructure. Increased temperatures, increased humidity, and a higher frequency of extreme heat events will lead to worsening air quality and increased risk of dehydration, respiratory problems (e.g., asthma), and cardiovascular problems (e.g., heart attacks) among individuals. Cumulative deterioration of public health from heat-related ailments and other climate stressors are projected to increase emergency room visits and hospitalizations (Ziegler, Morelli, and Fawibe 2017). Extreme events like heat waves, flooding, and wildfires can cause loss of life and directly damage buildings and infrastructure. Extreme weather events can shutdown critical services and inhibit individuals from reaching healthcare and other critical supports. Power infrastructure and supply chains can also be disrupted (No Harm Canada n.d.). Climate hazards can also have significant indirect impacts, such as increased water prices during drought conditions and reduced recreational opportunities along coastal communities from sea level rise.

Certain populations will be more vulnerable to climate change and its associated direct and indirect impacts. For example, children, seniors, and persons with underlying medical conditions (e.g., chronic heart disease) may be more susceptible to developing negative health outcomes from exposure to worsening air quality (CARB 2021). As discussed further below, the adverse impacts of climate change are also expected to disproportionately affect communities of color and underserved and low-income communities, which may have fewer resources to respond to changing conditions (Milanes et al. 2018).

To adapt to an uncertain future, California planners will need to anticipate climate change risks and build communities that remain resilient in the face of a changing

climate. The resources and guidance presented in the Handbook provide tools to support resilient planning.

Social Environment and Public Health

Exposure to Environmental Burdens

Underserved and low-income communities have historically suffered from disproportionately higher rates of pollution and other environmental hazards compared to more affluent communities. Socioeconomic determinants of public health—like educational attainment, housing costs, linguistic isolation, poverty, and unemployment rates—are shaped by public policy and planning. Past exclusionary housing and planning practices segregated and redlined certain populations. These policies made it more difficult for communities of color and low-income and immigrant populations to access critical resources necessary to support healthy, thriving, and prosperous lives.



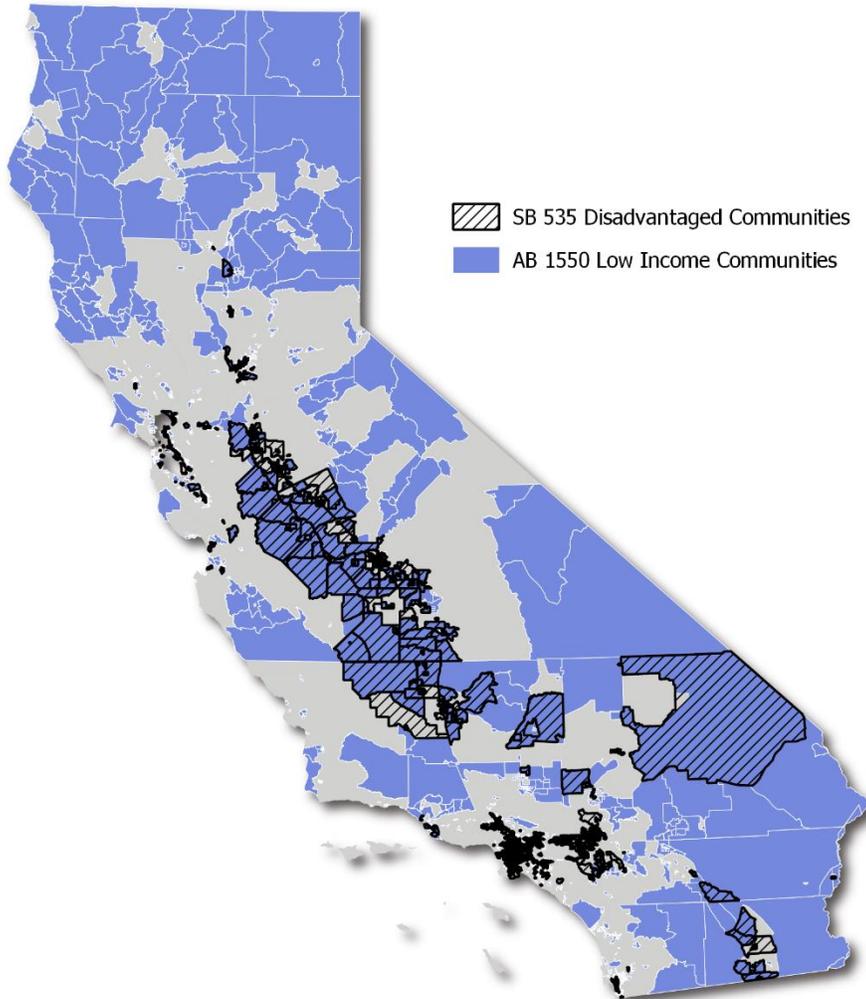
CalEPA designates *disadvantaged communities* as the 25 percent highest scoring census tracts using results of CalEnviroScreen. *Low-income communities* are census tracts with median household incomes at or below 80 percent of the statewide median income or at or below the state income limit threshold.

Structural and institutional racism continue to persist and shape California communities. Nearly one-quarter of children under 5 years old in California are currently living in poverty (August et al. 2021). Low-income populations often reside in neighborhoods that score among the lowest for key environmental and social indicators, such as access to clean water (Urban Environment & Social Inclusion Index 2021). The California Environmental Protection Agency (CalEPA) designates communities in California as disadvantaged or low-income for the purposes of allocating climate investments. Figure 2-1 shows these communities and highlights the considerable number of locations currently designated as disadvantaged, low-income, or both (CalEPA 2021).

The impacts of disproportionate exposure to environmental burdens are often felt at the individual, household, and community level (Gochfeld and Burger 2011; Katz 2012). For example, studies have found that low-income individuals have higher rates of hospitalization and greater risk of mortality when exposed to air pollution (Cakmak, Dales, and Judek 2006; Finkelstein et al. 2003). Communities with lower levels of education have higher rates of respiratory illnesses, such as childhood asthma, because of greater exposure to air pollution (August et al. 2021). Unemployment and poverty may also force individuals to live in areas with greater levels of environmental degradation (August et al. 2021). These disparities can magnify and exacerbate the spread and impact of disease and environmental disasters, as evidenced most recently by COVID-19: individuals of color have been hospitalized with COVID-19 at 3 to 4 times the rate of white

persons and have fatality rates about 2 to 2.5 times greater, according to the Centers for Disease Control and Prevention (CDC) (2021).

Figure 2-1. CalEPA Designated Disadvantaged and Low-Income Communities in California¹



Improving conditions in communities over-burdened by pollution and other environmental hazards will require targeted and systematic changes in funding and policy priorities. The resources and guidance presented in this Handbook provide tools to support more equitable planning.

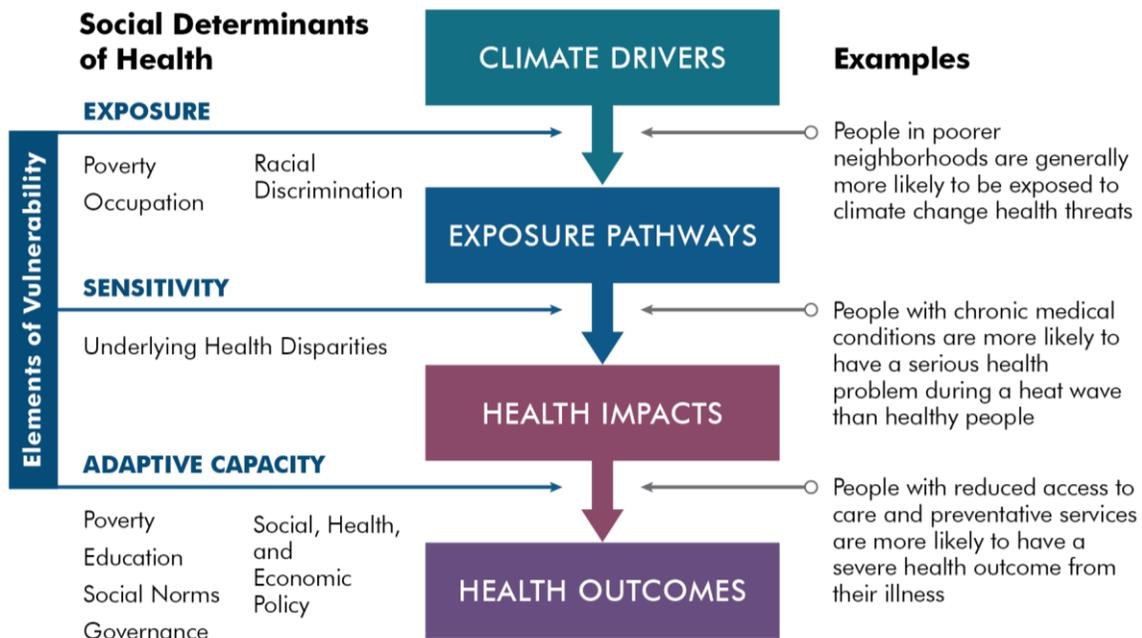
¹ Senate Bill 535-designated disadvantaged communities represent the 25% highest scoring census tracts in CalEnviroScreen, version 3.0.

Vulnerability to Climate Change

Underserved communities are expected to be disproportionately affected by the health, economic, and physical consequences of climate change. Individuals in these communities are likely to face a double threat from climate change to their health: they have higher exposure to climate hazards and have higher sensitivity to environmental stressors (August et al. 2021). Factors that contribute to higher exposure include occupation, time spent in risk-prone locations, ability to respond to extreme events, socioeconomic status, and the condition of community infrastructure (Gamble et al. 2016). Communities of color, low-income communities, outdoor workers, those with limited English language skills, children, the elderly, and people who are unhoused are all groups with higher vulnerability to climate hazards (Ebi et al. 2018; Gamble et al. 2016). These populations already experience higher rates of chronic medical conditions that can be worsened by climate change (Gamble et al. 2016).

Figure 2-2, which has been adapted from Gamble et al. (2016), illustrates the intersection of various social determinants on health and vulnerability to climate change. Implementing policies and processes to address underlying social factors that exacerbate health outcomes from climate exposures will improve the overall resilience and wellbeing of our communities.

Figure 2-2. Intersections of Social Determinants on Health and Vulnerability



Various tools and resources are available to help decisionmakers prioritize people and places for investments based on combined climate and health vulnerability. The California Department of Public Health's (2020) *Climate Change and Health Vulnerability Indicators for California* identifies the following three categories of indicators.

- Exposure indicators: heat, air quality, drought, wildfires, and sea level rise
- Population sensitivity indicators: children and elderly, poverty, education, race and ethnicity, outdoor workers, vehicle ownership, linguistic isolation, disability, health insurance, and violent crime rate
- Adaptive capacity indicators: air conditioning ownership, tree canopy, impervious surfaces, and public transit access.

CCHVlz is an online platform that allows users to visualize the indicator data across California (CDPH n.d.). Indicators are available at the census tract level or the next smallest scale available, such as the county or regional level.

The California Healthy Places Index (HPI) developed by the Public Health Alliance of Southern California (2021) showcases community conditions that predict life expectancy and can be used to compare and explore factors influencing health by census tract across California. The HPI reflects a combination of 25 community characteristics that are weighted and validated against life expectancy. Climate change exposures, social vulnerability, and adaptive capacity indicators are included as separate “decision support” layers that can be overlaid with the HPI map and scores. The indicators are grouped into eight policy action areas (economic, education, transportation, social, neighborhood, housing, clean environment, and healthcare access). Detailed policy guides offer specific solutions for healthier communities.

Federal and State Planning Efforts

Regulations are essential to helping economies and societies prosper. They provide structure and limits for government agencies, businesses, civil society organizations, and citizens. They also help realize public benefits like increased safety, improved health, economic opportunities, and fairness. Regulations often set goals to guide future planning and development efforts and create strategies and mechanisms to achieve those goals.

This section describes important federal and state regulations, policies, and legislation related to GHG emissions reductions, climate change vulnerability and adaptation, and social equity. These various requirements directly influence and inform planning efforts across California and are important to consider when reviewing measures in later chapters. Appendix B, *Federal and State Planning Framework*, provides greater detail on these efforts and resources for further reading.

The regulatory landscape is constantly shifting as amendments, revocations, and new requirements are adopted. The text in this section was drafted in 2021 and reflects the regulatory landscape as of this date. Readers may need to conduct additional research to ensure they have the latest information. Potential resources that may be consulted to provide updated information include the [State’s Adaptation Clearinghouse](#), the [Alliance of Regional Collaboratives for Climate Adaptation legislative tracking site](#), and the [Berkeley Law California Climate Policy Dashboard](#).

Federal Regulations and Requirements

There is no comprehensive federal law specific to climate change, societal equity, or the reduction of GHG emissions. However, in 2021, the United States rejoined the Paris Agreement to reduce national GHG emissions and the federal government submitted the United States' *Nationally Determined Contribution (NDC)*, which aims to reduce national GHG emissions by 50 to 52 percent by 2030 from 2005 levels. The NDC, executive orders, and other goals and efforts of the Biden Administration make up a new “whole-of-government” approach to reduce GHG emissions, increase climate resilience, improve equity, and boost economic growth (White House 2021a).

Clean Air Act and Greenhouse Gases

The federal *Clean Air Act (CAA)* was enacted in 1963 and has been amended numerous times since, most recently in 1990. The CAA established federal national ambient air quality standards (NAAQS) for six criteria pollutants and specifies future dates for achieving compliance. These standards were set to improve air quality and public health outcomes. For local areas not meeting those standards, states must submit and implement a State Implementation Plan that demonstrates how the standards will be met (U.S. EPA 2021).

In 2009, the U.S. Environmental Protection Agency (U.S. EPA) released its final *Greenhouse Gas Reporting Rule (Reporting Rule)*. The Reporting Rule is a response to the 2008 Consolidated Appropriations Act, which required U.S. EPA to develop mandatory reporting of GHGs above appropriate thresholds. The rule applies to most entities that emit 25,000 metric tons of carbon dioxide equivalent or more per year. Starting in 2010, facility owners were required to annually report their GHG emissions (U.S. EPA 2016).



U.S. EPA signed the *Endangerment Finding* and *Cause or Contribute Finding for Greenhouse Gases* under Section 202(a) of the CAA in 2009. Under the Endangerment Finding, EPA found that the current and projected concentrations of the six key GHGs—carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), perfluorinated carbons (PFCs), sulfur hexafluoride (SF₆), and hydrofluorocarbons (HFCs)—in the atmosphere threaten the public health and welfare of current and future generations (U.S. EPA 2020).

Fuel Efficiency Standards

The *Corporate Average Fuel Economy (CAFE)* standards were first enacted in 1975 to reduce energy consumption by improving the fuel economy of vehicles. The standards set fleet-wide averages that each automaker must meet. By improving the fuel efficiency of

vehicles, the standards improve national energy security, save consumers money, and reduce GHG emissions.

In 2011, the U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) issued a *Final Rule for Phase 2 GHG Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-duty Engines and Vehicles*. This rule includes three regulatory categories of heavy-duty vehicles—combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles—and applies to model years 2014–2018. Phase 2 of these standards were established in 2016 for model years 2019–2027 (U.S. EPA 2020b).

The passenger vehicle standards were updated in 2012 CAFE for model years 2017–2025 to incorporate stricter fuel economy requirements that required new passenger cars and light trucks to reach 54.5 miles per gallon by 2025. The program also included incentives to encourage adoption of new technologies to improve vehicle performance, such as electric vehicles (U.S DOT 2014).

In 2018, the *Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule* was proposed, which would amend prior CAFE and GHG emissions standards and create new standards for model year 2021–2026 vehicles and reduce fuel economy requirements. In September 2019, NHTSA and U.S. EPA established "The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program," which withdrew California's ability to create its own fuel economy standards under the CAA. The rule was finalized in 2020.² The SAFE rule has been legally challenged by California and many other states (NHTSA 2020). On April 22, 2021, NHTSA issued a notice of proposed rulemaking to repeal the SAFE Vehicles Rule (49 Code of Federal Regulations Parts 531 and 533). The public comment period for this repeal concluded on June 11, 2021.

Environmental Planning

Signed in 1970, the *National Environmental Policy Act (NEPA)* was enacted to minimize the negative environmental impacts of new development. It requires federal agencies to incorporate environmental considerations (including related social and economic effects) into planning and decision-making processes through a systematic interdisciplinary approach (U.S. EPA 2020).

Environmental Justice and Equity

Title VI of the Civil Rights Act of 1964 specifically prohibits discrimination based on race, color, or national origin by any program or activity that receives federal funds. All federal agencies help execute the provisions of Title VI. Violators of the act may lose federal funding for projects or programs.

Executive Order 12898, signed in 1994, directs all federal agencies to make achieving environmental justice part of their mission. Agencies are directed to identify and address

² CARB's EMFAC2021 accounts for future fuel economy and emissions impacts of the SAFE Vehicles Rule. While prior versions of EMFAC, including EMFAC2014 and EMFAC2017, do not account for the rule, CARB (2019a, 2020) has published off-model adjustment factors that can be used to adjust emissions output from EMFAC2014 and EMFAC2017.

disproportionately high and adverse human health or environmental effects of agency programs, policies, and activities on minority and low-income populations.

Pursuant to Executive Order 12898, the Council on Environmental Quality (CEQ) issued *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* to help agencies carry out the order. The guidance includes six principles for environmental justice analyses and provides guidance for how to assess human health or environmental effects on low-income, minority, and tribal communities (CEQ 1997). Following this guidance, federal agencies have developed plans and strategies to address environmental justice through agency actions.

In 2021, President Biden signed *Executive Order 13985*, which advances racial equity by addressing issues that have historically created inequity and advances civil rights, social justice, and equal opportunity. It declares that the government will address historic failures to invest sufficiently, justly, and equally in underserved communities, and will increase investment in underserved communities by promoting equitable delivery of government benefits and opportunities (White House 2021b).



The Soul Consoling Tower was built by Ryozo Kado in 1943 to remember the lives lost at the Manzanar War Relocation Center, where over 11,000 Japanese Americans were imprisoned during World War II by Executive Order 9066.

Also signed in 2021, *Executive Order 13990* recommits the executive branch to using scientific evidence in decision-making processes to advance public health and environment outcomes. More specifically, it states the administration's intent to ensure clean air and water, limit pollution and hold polluters responsible, reduce exposure to toxic chemicals, enhance environmental justice, and create well-paying union jobs. It also requires federal agencies to review federal regulations and actions that conflict with these objectives, with input from environmental justice organizations and other stakeholders (White House 2021c).

State Regulations and Rules

California has adopted numerous statewide laws, regulations, and policies to address GHG emissions reductions, climate adaptation, and equity. California has been a trailblazer and standard setter for climate-related regulations and programs. For example, California passed the Pavley 1 rule in 2002, which set the nation's first GHG standards for automobiles, and the state's GHG cap-and-trade program was the first multi-sector cap-and-trade program for GHG emissions in North America.

GHG Reduction Goals and Strategies

Executive Order S-3-05, signed in 2005, states that California is vulnerable to the effects of climate change and to help mitigate it, establishes GHG emissions reduction targets for

state agencies and requires the CalEPA to report the impacts of global warming on California and progress be made toward reducing GHG emissions through 2050 (Office of Governor 2005).

In 2006, *Assembly Bill 32, the California Global Warming Solutions Act of 2006*, established a cap on statewide GHG emissions and created a regulatory framework to reduce emissions to 1990 levels by 2020, which has been achieved. The California Air Resources Board (CARB) adopted a *GHG cap-and-trade program* in 2011 as a key mechanism to reduce GHG emissions and achieve California’s GHG reduction goal. The cap-and-trade program created a market-based system that set an overall emissions limit (a “cap”) for specific sectors, which is reduced annually. Revenues from the program are appropriated to state agencies to implement programs that reduce GHG emissions (C2ES n.d.). The cap-and-trade program was initially slated to sunset in 2020 but the passage of *Senate Bill (SB) 398* in 2017 extended the program through 2030.

Executive Order B-30-15, signed in 2015, established the connection between reducing GHG emissions to limit future climate change and adapting to current and future climate change impacts. It set a statewide interim GHG reduction target to reduce GHG emissions by 40 percent below 1990 levels by 2030 (Office of the Governor 2015). *SB 32* (passed in 2016) legislatively adopted this 2030 target. CARB adopted the *2017 Climate Change Scoping Plan* in November 2017 to meet the GHG reduction requirement set forth in SB 32. CARB is currently working on the *2022 Scoping Plan Update* that will assess progress toward achieving the 2030 target and outline a path to achieving carbon neutrality by midcentury.

Executive Order B-55-18 set a new state goal to achieve carbon neutrality as soon as possible (and no later than 2045) and to achieve and maintain net negative emissions thereafter. It also states that all policies and programs undertaken to achieve the goal should support climate adaptation, resource conservation, biodiversity, and improve public health in urban and rural communities, particularly low-income and underserved communities (Office of Governor 2018).

Complementary to the state’s larger GHG reduction goals, *SB 605* (2014) directed CARB, in coordination with other State agencies and local air districts, to develop a comprehensive *Short-Lived Climate Pollutants (SLCP) Reduction Strategy*. SLCPs include CH₄, HFC, and anthropogenic black carbon. These pollutants have relatively short atmospheric lifetimes but much greater influence on the climate, compared to CO₂. *SB 1383* directed CARB to approve and implement the SLCP Reduction Strategy to achieve specific SLCP reduction targets. CARB adopted the SLCP Reduction Strategy in March 2017 as a framework for achieving the reduction targets set by SB 1383 (BAAQMD 2020).

Clean Energy and Conservation

SB 1078 (2002) and SB 107 (2006), California’s *Renewables Portfolio Standard (RPS)* obligates investor-owned utilities (IOUs), energy service providers (ESPs), and Community Choice Aggregations (CCAs) to increase the proportion of energy generated from renewable energy sources. The most recent RPS target was established by SB 100 in 2018, which set a target to source 60 percent of energy from renewables by 2030 and

mandated 100 percent of electricity come from carbon-free energy sources by 2045 (California Legislative Information 2018).



The California Green Building Standards Code (Part 11, Title 24), known as *CALGreen*, was adopted in 2007 as part of the California Building Standards Code. The code includes voluntary and mandatory standards related to sustainable site development, energy efficiency, water conservation, material conservation, and reducing internal air contaminants (California Building Standards Commission 2019). *SB 350*, which was signed in 2015,

requires a doubling of energy efficiency (electrical and natural gas) by 2030, including improvements to the efficiency of existing buildings. As of the writing of this Handbook, the 2019 standards are the latest *CALGreen* standards. The 2022 standards are in development and will take effect on January 1, 2023.

The State has made water conservation a priority. The *California Water Action Plan* was developed by CNRA in 2016 and sets forth a collection of actions to improve reliable water supply, restore the state's ecosystems, and build a resilient and sustainable water resource system. The Water Action Plan also emphasizes diversified regional supply portfolios to increase resiliency to droughts, floods, population growth, and climate change (CNRA 2016).

Mandatory recycling requirements to reduce landfilled waste and associated GHG emissions were originally established in 2011 through *AB 341*. *AB 1826* was passed in 2014 and requires businesses that generate two cubic yards per week of solid waste (beginning on January 1, 2020) to arrange for recycling services for organic waste (e.g., food and lawn care waste).

In 2019, CARB and other state agencies jointly released the *2030 Natural and Working Lands Climate Change Implementation Plan*. The plan outlines specific conservation, restoration, and management activities that will improve resiliency, maintain a natural carbon sink, and improve environmental quality. The plan sets a 2030 goal to at least double the pace and scale of state-supported land activities by 2030 and beyond, among other goals. The plan estimates that these activities will increase emissions by 12.4-35.9 MMTCO₂e by 2030 and reduce emissions by 83.1-84.2 MMTCO₂e by 2045 (CARB 2019b).

Vehicle Fuel Efficiency

Pavley I (AB 1493) set the nation's first GHG standards for automobiles and required CARB to adopt vehicle standards that lower GHG emissions from new light-duty vehicles to the maximum extent feasible beginning in 2009 (CARB 2021a). In 2012, CARB

strengthened the Pavley standards through the *Advanced Clean Cars* regulations, which limit GHG emissions from passenger vehicles for model years 2017–2025 (CARB 2021b).

Executive Order S-01-07 establishes a statewide goal to reduce the carbon intensity of California’s transportation fuels by at least 10 percent by 2020. In 2018, CARB passed amendments to the Low Carbon Fuel Standard that set a target to reduce fuel carbon intensity by 20% by 2030, compared to a 2010 baseline (CARB 2018b).

The *Innovative Clean Transit (ICT) regulation* requires all public transit agencies to gradually transition to 100 percent zero-emission bus fleets by 2040. Large and small transit agencies must submit their ZEB rollout plans by July 1, 2020 and July 1, 2023, respectively. State funding to transit agencies is contingent upon the agencies’ compliance (CARB 2021d). To further accelerate the transition of zero-emission heavy-duty vehicles, CARB adopted the *Advanced Clean Truck Regulation* in June 2020. The regulation requires the sale of zero-emission medium-and-heavy-duty vehicles as an increasing percentage of total annual California sales from 2024 to 2035. By 2035, zero-emission truck/chassis sales must be 55 percent of Class 2b–3 truck sales, 75 percent of Class 4–8 straight truck sales, and 40 percent of truck tractor sales. By 2045, every new medium-and-heavy-duty truck sold in California will be zero-emission (ICCT 2020). This effort is currently in litigation.

Climate Adaptation

Executive Order S-13-08 requires the California Natural Resources Agency (CNRA) to develop a *Climate Adaptation Strategy* (CAS) in partnership with local, regional, state, and federal entities. It also required the development of a California Sea Level Rise Assessment Report that is reviewed every two years. Among other directives, it directs state agencies planning construction projects to assess the vulnerability to sea level rise and other climate change impacts (Adaptation Clearinghouse 2008). In 2009, California adopted a statewide CAS that summarized climate change impacts and recommended adaptation strategies for seven sectors.

Executive Order B-30-15 requires the CNRA update the state’s CAS every 3 years and orders state agencies to take current and future climate impacts into account in all planning and investment decisions (Office of Governor 2015). In 2018, the CNRA updated the CAS to describe ongoing climate actions and recommend cost-effective and achievable next steps to respond to climate change in 11 sectors (CNRA 2018).

SB 246 establishes an integrated climate adaptation and resiliency plan to coordinate regional and local efforts with state strategies. The program emphasizes climate equity considerations throughout all sectors and regions to help develop holistic strategies for climate adaptation (California Legislative Information 2015). As a result of SB 246, in 2020, a new version of the *California Climate Adaptation Planning Guide* was developed by the California Emergency Management Agency and CNRA to include new requirements for local adaptation planning.

SB 379 ensures that climate adaptation is integrated into local jurisdictions' general plan processes. It requires California cities and counties to integrate climate adaptation into the safety element of their general plans by conducting a vulnerability assessment to identify local climate change risks and then develop adaptation and resilience goals, policies, objectives, and implementation measures based on the assessment (OPR 2017). Furthermore, **SB 1035** requires local planning agencies to review and revise the safety element of city or county general plans as necessary to address new climate adaptation risks and resiliency strategies. Planning agencies must do this during each revision of the housing element of the general plan or a local hazard mitigation plan, and not less than once every 8 years (California Legislative Information 2018b).



The State Water Resources Control Board has taken a variety of actions to respond to climate change, including the adoption of the *Comprehensive Response to Climate Change*. It requires the State Water Board to integrate proactive measures to respond to climate change in all its actions. The resolution also outlines specific measures to reduce GHG emissions, improve ecosystem resilience, and respond to climate change impacts (State Water Board 2017).

In response to the increasing frequency and intensity of wildfires across California, the *Wildfire Preparedness and Response* bill was signed in 2018. It allocates \$200 million annually from 2019-2024 to fund grants to fire departments, cities, counties, and nonprofit organizations to help reduce forest fuel loads with thinning and prescribed burns in high-risk areas. The California Department of Forestry and Fire Protection (CalFire) distributes the funding and provides technical assistance. The bill also requires utilities to create and implement wildfire mitigation plans (Adaptation Clearinghouse 2018).

The California Coastal Commission adopted the *Sea Level Rise Policy Guidance* in 2015 and an update in 2018. The guidance provides an overview of the sea level rise science and broad recommendations for how to plan for and address sea level rise impacts. The guidance is broadly applicable and is used by the Coastal Commission, local governments, project applicants, and other stakeholders. The Coastal Commission describes the guidance as “a menu of options” that local planners can select from as appropriate, rather than a checklist of requirements (CCC 2019).

Social Equity

SB 1000 requires cities and counties with disadvantaged communities to include an environmental justice element in their general plans to ensure that local governments address environmental justice when planning long-term land use and growth goals and policies. Local governments must identify any disadvantaged communities and develop measures to mitigate and reduce health risks that can be attributed to the environment

(Strategic Growth Council 2021). [SB 32](#) (discussed above) also includes an environmental justice component that requires GHG reduction targets to be met in a way that benefits the most disadvantaged communities (California Legislative Information 2016a). The [GHG cap-and-trade program](#) (discussed above) requires 35 percent of program revenue to be directed toward environmentally disadvantaged and low-income communities (California Legislative Information 2016a).

[AB 2722](#) was signed in 2016 to help create more sustainable cities, to address climate justice, and to help California meet its GHG emissions reduction goals. To achieve this, the California Strategic Growth Council created the Transformative Climate Communities program, which issues grants to develop and implement transformative climate plans. The funds are used to create and implement cross-cutting community plans that improve air and water quality, reduce emissions, and provide climate, economic, employment, and health benefits to disadvantaged communities (California Legislative Information 2016b).

[AB 617](#) requires the State to develop a statewide annual reporting system for emissions of criteria air pollutants and toxic air contaminants for certain stationary sources. It also requires the State to prepare a monitoring plan for emissions and to prepare a statewide strategy to reduce emissions of toxic air contaminants and criteria pollutants in communities that experience a high cumulative exposure burden, in consultation with environmental justice groups and other stakeholders. (California Legislative Information, 2017). In response, CARB established the [Community Air Protection Program \(CAPP\)](#), which focuses on reducing pollution exposure to communities that are most affected by air pollution. The CAPP provides funds for deploying clean technologies in communities and to retrofit pollution controls on industrial sources (CARB 2021c).

Planning Guidance

The [California Environmental Quality Act \(CEQA\)](#) guidelines, first established in 1970, explain how to determine if an activity is subject to environmental review, what steps are involved in the process, and what documents are required. With respect to GHG emissions, the guidelines require agencies to describe, calculate, or estimate the amount of GHG emissions that are expected to result from a project. They also require a determination of whether a project would exacerbate physical climate change effects (OPR 2021). [SB 743](#) required revisions to the CEQA Guidelines (which occurred in 2018 and became effective in 2020) to establish new impact analysis criteria for the assessment of a project's transportation impacts. The intent behind SB 743 and revising the CEQA Guidelines was to integrate and better



Photo Credit: Port of San Francisco, March 2019

balance the needs of congestion management, infill development, active transportation, and GHG emissions reduction (Caltrans 2021).

SB 375 provides a planning process that coordinates land use planning, regional transportation plans, and funding priorities to help California meet its GHG reduction goals. SB 375 requires regional transportation plans developed by metropolitan planning organizations to incorporate a sustainable communities strategy (SCS) in their regional transportation plans (Institute for Local Government 2015). The goal of the SCS is to reduce regional vehicle miles traveled through land use planning and transportation planning.

Building Future Equity and Resilience through Better Planning

As discussed in *Social and Environment and Public Health*, underserved and low-income communities and communities of color experience disproportionate environmental and climate change impacts. It is important that resources be targeted to historically overburdened communities when planning for an equitable and climate-resilient future. Equally, decisionmakers must consider potential unintended consequences that may arise from implementation of emission reduction or adaptation measures. Striving for equity may also mean considering non-traditional measures that create socioeconomic co-benefits.

Planners can support more equitable development by engaging directly with local communities. Community-driven processes allow community members and organizations to set adaptation priorities and influence investments, identify inequities in planning, direct resources to the most at-risk areas and groups, and promote democracy and transparency in government (Georgetown Climate Center 2017).

The GHG emission reduction and climate adaptation measure descriptions presented in Chapters 3 and 4 include equity considerations. Chapter 5, *Measures for Advancing Health and Equity*, presents a non-exhaustive list of measures, examples, and resources to promote future health and equity in project and community planning. Chapter 6, *Resources to Support Resilient and Equitable Emission Reduction Planning*, provides resources and guidance on incorporating equity into resilient planning.

References

- Adaptation Clearinghouse. 2008. *California Executive Order S-13-08 Requiring State Adaptation Strategy*. Available: <https://www.adaptationclearinghouse.org/resources/california-executive-order-s-13-08-requiring-state-adaptation-strategy.html>. Accessed: May 2021.
- Adaptation Clearinghouse. 2018. *California SB 901—Wildfire Preparedness and Response*. Available: <https://www.adaptationclearinghouse.org/resources/california-sb-901-wildfire-preparedness-and-response.html>. Accessed: May 2021.

August, L., K. Bangla, L. Plummer, S. Prasad, K. Ranjbar, A. Slocombe, and W. Wieland. 2021. *Update to the California Communities Environmental Health Screening Tool: CalEnviroScreen 4.0. Public Draft*. California Environmental Protection Agency and Office of Environmental Health Hazard Assessment. Available: <https://oehha.ca.gov/media/downloads/calenviroscreen/document/calenviroscreen40reportd12021.pdf>. Accessed: May 2021.

Bay Area Air Quality Management District (BAAQMD). 2020. *Request for Comments Report Regulation 13, Climate Pollutants: Rule 2, Organic Material Handling Operations*. Available: https://www.baaqmd.gov/~media/dotgov/files/rules/regulation-13-rule-2/documents/20200127_rfc_r1302-pdf.pdf?la=en. Accessed: May 2021.

Bedsworth, L., D. Cayan, G. Franco, L. Fisher, S. Ziaja. (California Governor's Office of Planning and Research, Scripps Institution of Oceanography, California Energy Commission, California Public Utilities Commission). 2018. *Statewide Summary Report. California's Fourth Climate Change Assessment*. Publication number: SUMCCCA4-2018-013.

Cakmak S., R. E. Dales, and S. Judek. 2006. Respiratory health effects of air pollution gases: modification by education and income. *Archives of Environmental and Occupational Health* 61(1):5–10.

California Air Resources Board (CARB). 2015. *Air Quality and Land Use Handbook: A Community Health Perspective*. Available: <https://ww3.arb.ca.gov/ch/handbook.pdf>. Accessed: June 2021.

California Air Resources Board (CARB). 2018a. *AB 32 Global Warming Solutions Act of 2006*. Available: <https://ww2.arb.ca.gov/resources/fact-sheets/ab-32-global-warming-solutions-act-2006>. Accessed: May 2021.

California Air Resources Board (CARB). 2018b. *Amendments to the Low Carbon Fuel Standard Regulation and to the Regulation on Commercialization of Alternative Diesel Fuels*. Available: <https://ww3.arb.ca.gov/regact/2018/lcfs18/fsorlcfs.pdf>. Accessed: May 2021.

California Air Resources Board (CARB). 2019a. *EMFAC Off-Model Adjustment Factors to Account for the SAFE Vehicle Rule Part One*. November. Available: https://ww3.arb.ca.gov/msei/emfac_off_model_adjustment_factors_final_draft.pdf. Accessed: September 2021.

California Air Resources Board (CARB). 2019b. *California 2030 Natural and Working Lands Climate Change Implementation Plan*. Available: <https://ww2.arb.ca.gov/sites/default/files/2020-10/draft-nwl-ip-040419.pdf>. Accessed: May 2021.

California Air Resources Board (CARB). 2020. *EMFAC Off-Model Adjustment Factors for Carbon Dioxide (CO₂) Emissions to Account for the SAFE Vehicles Rule Part One and the Final SAFE Rule*. June. Available:

https://ww3.arb.ca.gov/msei/emfac_off_model_co2_adjustment_factors_06262020-final.pdf. Accessed: September 2021.

California Air Resources Board (CARB). 2021a. *California's Greenhouse Gas Vehicle Emission Standards under Assembly Bill 1493 of 2002 (Pavley)*. Available:

<https://ww2.arb.ca.gov/californias-greenhouse-gas-vehicle-emission-standards-under-assembly-bill-1493-2002-pavley>. Accessed: May 2021.

California Air Resources Board (CARB). 2021b. *Low-Emission Vehicle (LEV III) Program*. Available:

<https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/lev-program/low-emission-vehicle-lev-iii-program>. Accessed: May 2021.

California Air Resources Board (CARB). 2021c. *Community Air Protection Program*. Available:

<https://ww2.arb.ca.gov/capp/about>. Accessed: May 2021.

California Air Resources Board (CARB). 2021d. *Innovative Clean Transit*. Available:

<https://ww2.arb.ca.gov/our-work/programs/innovative-clean-transit/about>. Accessed: May 2021.

California Building Standards Commission. 2019. *2019 California Green Building Standards Code*. Available:

https://calgreenenergyservices.com/wp/wp-content/uploads/2019_california_green_code.pdf. Accessed: May 2021.

California Coastal Commission. 2019. *Sea Level Rise: Adopted Policy Guidance*. Available:

<https://www.coastal.ca.gov/climate/slrguidance.html>. Accessed: May 2021.

California Department of Public Health (CDPH). 2020. *Climate Change and Health Vulnerability Indicators for California*. Available:

<https://www.cdph.ca.gov/Programs/OHE/Pages/CC-Health-Vulnerability-Indicators.aspx>. Accessed: September 2021.

California Department of Public Health (CDPH). n.d. *Welcome to the CCHViz*. Available:

<https://skylab.cdph.ca.gov/CCHViz/>. Accessed: September 2021.

California Environmental Protection Agency. 2021. *California Climate Investments to Benefit Disadvantaged Communities*. Available:

<https://calepa.ca.gov/envjustice/ghginvest/>. Accessed: May 2021.

Cal Fire. 2021. *Top 20 Largest California Wildfires*. Available:

https://www.fire.ca.gov/media/4jandlhh/top20_acres.pdf. Accessed: November 2021.

California Department of Transportation (Caltrans). 2021. *Senate Bill (SB) 743 Implementation*. Available:

<https://dot.ca.gov/programs/transportation-planning/office-of-smart-mobility-climate-change/sb->

Milanes, C., T. Kadir, B. Lock, L. Monserrat, N. Pham, and K. Randles. 2018. *Indicators of Climate Change*. Office of Environmental Health Hazard Assessment and California Environmental Protection Agency. May.

Center for Climate and Energy Solutions (C2ES). No Date. *California Cap and Trade*. Available: <https://www.c2es.org/content/california-cap-and-trade/>. Accessed: May 2021.

Centers for Disease Control and Prevention (CDC). 2021. *Risk for COVID-19 Infection, Hospitalization, and Death by Race/Ethnicity*. Last revised: March 12. Available: <https://www.cdc.gov/coronavirus/2019-ncov/covid-data/investigations-discovery/hospitalization-death-by-race-ethnicity.html>. Accessed: March 2021.

Council on Environmental Quality (CEQ). 1997. *Environmental Justice: Guidance Under the National Environmental Policy Act*. Available: https://www.epa.gov/sites/production/files/2015-02/documents/ej_guidance_nepa_ceq1297.pdf. Accessed: May 2021.

Ebi, K. L., A. Bole, A. Crimmins, G. Glass, S. Saha, M. Shimamoto, J. Trtanj, J. White-Newsome, J. Balbus, and G. Luber. 2018. *Human Health*. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, pp. 539–571. doi: 10.7930/NCA4.2018.CH14.

Finkelstein, M., M. Jerrett, P. DeLuca, N. Finkelstein, D. K. Verma, K. Chapman, and M. Sears. 2003. Relation between income, air pollution and mortality: a cohort study. *Cmaj* 169(5):397–402.

Gamble, J. L., J. Balbus, M. Berger, K. Bouye, V. Campbell, K. Chief, K. Conlon, A. Crimmins, B. Flanagan, C. Gonzales-Maddux, E. Hallisey, S. Hutchins, L. Jantarasami, S. Khoury, M. Kiefer, J. Klling, K. Lynn., A. Manangan, M. McDonald, R. Morello-Frosch, M. H. Redsterr, P. Sheffield, K. T. Tart, J. Watson, K. P. Whyte, and A. F. Wolkin. 2016. Ch. 9: Populations of Concern. *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. U.S. Global Change Research Program, Washington, DC, 247–286. <http://dx.doi.org/10.7930/JOQ81B0T>. Accessed: May 2021.

Georgetown Climate Center. 2017. *Opportunities for Equitable Adaptation in Cities*. Available: https://www.georgetownclimate.org/files/report/GCC-Opportunities_for_Equitable_Adaptation-Feb_2017.pdf. Accessed: May 2021.

Gochfeld, M. and J. Burger. 2011. Disproportionate Exposures in Environmental Justice and Other Populations: The Importance of Outliers. *American Journal of Public Health*. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3222496/>. Accessed: May 2021.

Governor's Office of Planning and Research (OPR). 2017. *State of California General Plan Guidelines*. Available: https://opr.ca.gov/docs/OPR_COMPLETE_7.31.17.pdf. Accessed: June 2021.

Governor's Office of Planning and Research (OPR). 2021. *SB 743 Frequently Asked Questions*. Available: <https://opr.ca.gov/ceqa/updates/sb-743/faq.html#draft-docs>. Accessed: May 2021.

Institute for Local Government. 2015. *The Basics of SB 375*. Available: <https://www.ca-ilg.org/post/basics-sb-375>. Accessed: May 2021.

The International Council on Clean Transportation (ICCT). 2020. *California's Advanced Clean Trucks Regulation: Sales Requirements for Zero-Emission Heavy-Duty Trucks*. Available at: <https://theicct.org/sites/default/files/publications/CA-HDV-EV-policy-update-jul2020.pdf>. Accessed: May 2021.

Katz, Cheryl. 2012. *People in Poor Neighborhoods Breathe More Hazardous Particles* *Scientific American*. Available: <https://www.scientificamerican.com/article/people-poor-neighborhoods-breathe-more-hazardous-particles/> Accessed: May 2021.

National Highway Traffic Safety Administration (NHTSA). 2020. *SAFE: The Safer Affordable Fuel-Efficient 'SAFE' Vehicles Rule*. Available: [https://www.nhtsa.gov/corporate-average-fuel-economy/safe#:~:text=Aug.&text=The%20Safer%20Affordable%20Fuel%2DEfficient%20\(SAFE\)%20Vehicles%20Rule%20proposed,model%20years%202021%20through%202026](https://www.nhtsa.gov/corporate-average-fuel-economy/safe#:~:text=Aug.&text=The%20Safer%20Affordable%20Fuel%2DEfficient%20(SAFE)%20Vehicles%20Rule%20proposed,model%20years%202021%20through%202026). Accessed: May 2021.

No Harm Canada. No Date. *Health Care Without Harm. Climate change, health, and health care*. Available: <https://noharm-uscanada.org/sites/default/files/Climate.Physician.Network.pdf> Accessed: May 2021.

Office of Governor. 2005. *Executive Order S-3-05*. Available: [http://static1.squarespace.com/static/549885d4e4b0ba0bff5dc695/t/54d7f1e0e4b0f0798cee3010/1423438304744/California+Executive+Order+S-3-05+\(June+2005\).pdf](http://static1.squarespace.com/static/549885d4e4b0ba0bff5dc695/t/54d7f1e0e4b0f0798cee3010/1423438304744/California+Executive+Order+S-3-05+(June+2005).pdf). Accessed: May 2021.

Office of Governor. 2015. *Governor Brown Establishes Most Ambitious Greenhouse Gas Reduction Target in North America*. Available: <https://www.ca.gov/archive/gov39/2015/04/29/news18938/index.html>. Accessed: May 2021.

Office of Governor. 2018. *Executive Order B-55-18 to Achieve Carbon Neutrality*. Available: <https://www.ca.gov/archive/gov39/wp-content/uploads/2018/09/9.10.18-Executive-Order.pdf>. Accessed: May 2021.

Public Health Alliance of Southern California. 2021. *The California Healthy Places Index*. Last revised: April 22, 2021. Available: <https://healthyplacesindex.org/>. Accessed: May 6, 2021.

State Water Resources Control Board. 2017. *State Water Resources Control Board Resolution No. 2017-0012*. May 2021.

Strategic Growth Council. 2021 *Transformative Climate Communities*. Available: <https://sgc.ca.gov/programs/tcc/>. Accessed: May 2021.

Urban Environment & Social Inclusion Index. 2021. *Key Findings. Main Takeaways for the 2020 Urban Environment and Social Inclusion Index Analysis*. Available: <https://datadrivenlab.org/urban/report/key-findings/>. Accessed: June 2021.

U.S. Department of Transportation (U.S. DOT). 2014. *Corporate Average Fuel Economy (CAFE) Standards*. Available: <https://www.transportation.gov/mission/sustainability/corporate-average-fuel-economy-cafe-standards>. Accessed: May 2021.

U.S. Environmental Protection Agency (U.S. EPA). 2016. *Greenhouse Gas Reporting Program (GHGRP)*. Available: <https://www.epa.gov/ghgreporting/10302009-rule>. Accessed: May 2021.

U.S. Environmental Protection Agency (U.S. EPA). 2020a. *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under the Section 202(a) of the Clean Air Act*. Available: <https://www.epa.gov/ghgemissions/endangerment-and-cause-or-contribute-findings-greenhouse-gases-under-section-202a-clean#:~:text=On%20April%2017%2C%202009%2C%20the,received%20over%20380%2C000%20public%20comments>. Accessed: May 2021.

U.S. Environmental Protection Agency (U.S. EPA). 2020b. *Regulations for Greenhouse Gas Emissions from Commercial Trucks & Buses*. Available: <https://www.epa.gov/regulations-emissions-vehicles-and-engines/regulations-greenhouse-gas-emissions-commercial-trucks>. Accessed: May 2021.

U.S. Environmental Protection Agency (U.S. EPA). 2021. *Clean Air Act Overview*. Available: <https://www.epa.gov/clean-air-act-overview/clean-air-act-text#:~:text=The%20Clean%20Air%20Act%20is,has%20made%20several%20minor%20changes>. Accessed: May 2021.

White House. 2021a. *Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government*. Available: <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-advancing-racial-equity-and-support-for-underserved-communities-through-the-federal-government/>. Accessed: May 2021.

White House. 2021b. *Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*. Available: <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-protecting-public-health-and-environment-and-restoring-science-to-tackle-climate-crisis/>. Accessed: May 2021.

White House. 2021c. *FACT SHEET: President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies*. Available: <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/>. Accessed: May 2021.

Ziegler, C., V. Morelli, and O. Fawibe. 2016. Climate change and underserved communities. *Primary Care: Clinics in Office Practice* 44 (1)171–184. doi:10.1016/j.pop.2016.09.017.