

CALIFORNIA:

California continues to pioneer ambitious public policies aimed at addressing climate change, protecting public health, and growing the economy, but California cannot do it alone. Through cooperative initiatives with other jurisdictions – such as the U.S. Climate Alliance, the Global Climate Action Summit, the Under2 Coalition, and America’s Pledge – leaders from across the nation and the world are working together to find strategies that reduce greenhouse gas emissions.

FINANCE

- *Overview.* California has multiple funding mechanisms to support strategies and technologies that drive emissions reductions. Proceeds from the Cap-and-Trade program, bonds, electricity ratepayer funds, tax credits, Property Assessed Clean Energy funding, and on-bill financing are among the current mechanisms.
- *Greenhouse Gas Reduction Fund (GGRF).* Proceeds from the Cap-and-Trade Program facilitate comprehensive and coordinated investments throughout California that further the State’s climate goals. Under current law, 60 percent of annual Cap-and-Trade auction proceeds resulting from sales of state-owned allowances are allocated on an ongoing basis to public transit, affordable housing, sustainable communities, and high-speed rail. In 2016, California directed \$900 million in Cap-and-Trade proceeds to greenhouse gas (GHG) reducing programs that benefit disadvantaged communities, support clean transportation, and protect natural ecosystems. As of March 2017, nearly \$3.4 billion has been appropriated to agencies implementing GHG emission reduction programs.
- *California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA).* CAEATFA assists in reducing the State’s GHG emissions by increasing the development and deployment of renewable energy sources, energy efficiency, advanced transportation, and manufacturing technologies to reduce air pollution, conserve energy, and promote economic development and jobs. This includes programs like the California Hub for Energy Efficiency Financing and the Sales Tax Exclusion. With up to \$100 million per year allocated to the program, the Sales Tax Exclusion excludes qualified property from state sales and use taxes for advanced manufacturing, recycled feedstock projects, and advanced transportation technologies.
- *Property Assessed Clean Energy (PACE).* The PACE Loss Reserve Program works with partners and lenders to support financing for energy or water efficiency and clean energy home improvements. Property owners in a PACE-designated area can use PACE financing to retrofit their homes without putting any money down and repay via property tax bills. The PACE Loss Reserve Program’s goal is to increase availability of residential PACE financing by making first mortgage lenders whole for direct losses because of a PACE lien in a foreclosure or forced sale.
- *Green Bonds.* California’s Lending for Energy and Environmental Needs Center (CLEEN) provides direct public financing to municipalities, universities, schools, and hospitals to help meet the State’s goals for greenhouse gas reduction, water conservation, and environmental preservation. Financing can be through a direct loan from IBank or publicly offered tax-exempt bonds in amounts from \$500 thousand to \$30 million. The CLEEN Center offers two programs: the Statewide Energy Efficiency Program and the Light Emitting Diode Street Lighting Program.

MULTI-SECTOR

- *Climate Change Legislation.* The California Global Warming Solutions Act of 2006 (Assembly Bill 32) established California as a global leader in reducing GHG emissions. From its inception, Assembly Bill 32 recognized the importance of California’s climate leadership and engagement with other jurisdictions, and directed California to identify the most cost-effective strategies and methods to reduce GHG emissions and manage GHG reduction programs. It required the State to reduce GHG emissions to 1990 levels by 2020. Furthermore, in September 2016, Senate Bill 32 mandated a statewide goal to reduce GHG emissions 40 percent below 1990 levels by 2030. This legislation will set California on a trajectory to achieving its overarching goal of reducing GHG emissions 80 percent below 1990 levels by 2050.
- *Cap-and-Trade.* California’s economy-wide GHG emissions trading system, the Cap-and-Trade Program, is the only multi-sector GHG emissions trading system in the United States. The Cap-and-Trade Program establishes a declining limit on major sources of GHG emissions, and it creates a powerful economic incentive for major investment in cleaner, more efficient technologies. The Cap-and-Trade Program applies to emissions that cover about 85 percent of the State’s GHG emissions. California creates allowances equal to the total amount of permissible emissions (i.e. the cap) over a given compliance period. One allowance equals one metric ton of GHG emissions. Fewer allowances are created each year, thus the annual cap declines and statewide emissions are

reduced over time. In July 2017, California passed legislation clarifying the role of the Cap-and-Trade Program in achieving the State's 2030 limit of at least a 40 percent reduction in greenhouse gases from 1990 levels.

- *CalEnviroScreen*. CalEnviroScreen's science-based mapping tool helps to identify California communities that are disproportionately burdened by multiple sources of pollution and are especially vulnerable to pollution's effects. The tool uses 20 environmental, health, population, and socioeconomic indicators to produce a numerical score for each census tract in the State. The results are depicted on maps so that different communities can be compared to one another. Census tracts with the highest CalEnviroScreen scores are designated as disadvantaged communities for investing Cap-and-Trade auction proceeds.
- *Short-lived Climate Pollutants*. California established the nation's toughest restrictions on destructive super pollutants including black carbon, fluorinated gases, and methane. If followed worldwide, these acts would help cut the projected rate of global warming in half by 2050. California requires a 50 percent reduction in black carbon and 40 percent reduction in methane and hydrofluorocarbon from 2013 levels by 2030. Through the "Short-Lived Climate Pollutant Reduction Strategy," California is implementing strategies aimed at reducing these potent pollutants.

POWER SECTOR

- *Overview*. California is moving to decarbonize its electricity sector through mandates, incentives, and other innovative policies and programs. As the State moves toward its target of 50% renewable energy and beyond, there will be a need for advanced clean technologies and strategies, including demand reduction and response, energy storage, dynamic pricing, and more to ensure California's electricity system is clean and reliable.
- *Renewables Portfolio Standard (RPS)*. Established in 2002, California's RPS is one of the most ambitious renewable energy policies in the nation. Enacted with bipartisan support, and accelerated and expanded by subsequent legislation, California's RPS establishes increasingly progressive renewable energy procurement targets for the State's load-serving entities. It requires both retail sellers and local publicly owned electric utilities to increase their procurement of eligible renewable energy resources to 33 percent of retail sales by 2020 and 50 percent by 2030. As of August 2017, 29 percent of California's retail sales were met with renewable resources. This puts California ahead of schedule for meeting its 2020 renewable energy targets.
- *California Solar Initiative (CSI)*. Enacted in 2006, the CSI program is a \$3.3 billion sustained commitment to investing in rooftop solar in California. The CSI was comprised of several incentive programs aimed at installing rooftop solar on homes and apartments. As of June 2017, the CSI program provided incentives for 1,876 megawatts (MW) of installed capacity and reserved funding for about 80 MW of pending capacity toward achieving the goal of 1,940 MW for commercial buildings and existing homes in electric investor-owned utility service territories. In total, California has over 5,800 MW of self-generation solar photovoltaic capacity built in the State.
- *The Desert Renewable Energy Conservation Plan (DRECP)*. The State's DRECP is a major component of California's renewable energy planning efforts, helping to provide effective protection and conservation of desert ecosystems, while allowing for the appropriate development of renewable energy projects. Focused on 22.5 a million acre desert area, the land use plan designates 388,000 acres of public lands managed by the U.S. Bureau of Land Management for solar, wind, and geothermal development; 4.2 million acres to conservation areas; and 3.5 million acres to recreation areas.
- *Electric Program Investment Charge (EPIC)*. The EPIC program supports investments in clean energy technologies that provide benefits to the electricity ratepayers of certain investor-owned utilities. Most of the EPIC program funds clean energy research, demonstration and deployment projects that support California's energy policy goals and promote greater electricity reliability, lower costs, and increased safety. EPIC fills critical funding gaps within the energy innovation pipeline to advance technologies, tools, and strategies of near zero net energy residential homes and commercial buildings, high-efficient businesses, low-carbon localized generation, sustainable bioenergy systems, electrification of the transportation system, and a resilient grid that is supported by a highly flexible and robust distribution and transmission infrastructure. EPIC funds will provide approximately \$162 million annually from 2012 to 2020 primarily to address policy and funding gaps related to the development, deployment, and commercialization of next generation clean energy technologies.

- *Energy storage.* Increasing the amount of intermittent renewable resources will require strategies that can better integrate these resources onto the electrical system, such as storage technology. To advance energy storage, the State has set a requirement on investor-owned utilities to procure over 1.8 gigawatts (GW) of energy storage capacity. In addition, through the Self-Generation Incentive Program, residential energy storage is eligible for ratepayer-funded incentives.

TRANSPORTATION

- *Overview.* As the largest source, the transportation sector in California makes up almost 40% of California’s greenhouse gas emissions. California is advancing cleaner transportation options, changing land use planning to reduce travel demand, and building a high-speed rail network that will be the backbone of an integrated transit system.
- *Zero Emissions Vehicles (ZEVs).* California set a goal of 1.5 million zero emissions vehicles by 2025, improving air quality by reducing local pollution and GHG emissions, while saving consumers money and helping new companies grow and create jobs. In addition, California, in conjunction with the International ZEV Alliance, committed to a goal of all passenger vehicle sales to be ZEV by 2050. California is one of the world’s largest markets for light-duty ZEVs, with ZEV ownership in the State currently exceeding 318,000 passenger vehicles, supported by over 13,000 electric vehicle charging stations and 30 hydrogen fueling stations. As of September 2017, Californians drive about half of all ZEVs on the road in the U.S., while the U.S. comprises about one-third of the world ZEV market. California provides incentives for the purchase of ZEVs, allocates grants to accelerate charging infrastructure for battery electric vehicles and hydrogen fueling infrastructure for fuel cell electric vehicles, and supports programs to advance near zero and ZEVs in a wide variety of fleets from transit buses to port equipment. California’s “ZEV Action Plan” identifies specific strategies and actions to meet the 2025 target, and the “Community Readiness Guidebook” helps communities to support their residents and businesses in making the switch to ZEVs.
- *Low Carbon Fuel Standard (LCFS).* The LCFS is a key part of a comprehensive set of programs in California to cut GHG emissions and help the State achieve its climate goals. The LCFS is designed to decrease the carbon intensity of California’s transportation fuel pool and provide an increasing range of low-carbon and renewable alternative transportation fuels. The LCFS is fuel-neutral, and lets market forces determine the mix of fuels used to reach the program targets. Regulated parties can meet the standard by reducing the carbon intensity of the fuel pool they produce or import or by purchasing LCFS credits from other parties that produce or supply lower carbon transportation fuels. Through this market mechanism, the LCFS encourages the production of low carbon fuels and investments in capital projects that reduce the carbon intensity of more traditional fuels. California’s LCFS requires a 10 percent reduction in the carbon intensity of transportation fuels in California by 2020. California coordinates with similar programs in Oregon, through the Pacific Coast Collaborative.
- *High-Speed Rail.* California’s high-speed rail program, connecting the north and south of the State, represents the backbone of the State’s transition to electrified transportation. Powered by 100 percent renewable energy, the high-speed rail will produce a significant “mode shift” in transportation by expanding consumer choice for travel, reducing medium- and long-distance car and airplane trips, and enabling transit-oriented communities. High-speed rail stations are being planned and designed to connect to regional public transit. Construction began in 2015, and so far, 119 miles of construction activities are underway.

EFFICIENCY

- *Overview.* California has long been a leader in efforts to improve building energy efficiency through advanced building codes and appliance standards, a wide variety of incentive programs, design and installation training, and public outreach. California’s per capita energy consumption is among the lowest in the country and has remained relatively constant since 1974 – in sharp contrast to the rest of the country.
- *Building Energy Efficiency Standards.* California’s Building Energy Efficiency Standards are working towards the goals that all new residential construction be zero net energy by 2020, and all new commercial be so by 2030. Another goal in California is to double energy efficiency savings in electricity and natural gas final end uses by 2030. Moreover, the State has developed cost-effective minimum appliance efficiency standards for a variety of lighting, electronics, and other common products. For example, in 2016, California adopted lighting standards expected to save Californians more than \$4 billion in electricity costs. In the same year, California also adopted

efficiency standards for computers and monitors to save consumers more than \$370 million per year. California is instituting requirements for energy benchmarking of all non-residential buildings above 30,000 square feet. The State is also using standardized reporting and analysis tools for statewide assessment and trending of existing building energy performance patterns, which will call for evaluation of current and future actions. California is promoting a number of financing tools for home energy retrofits and will increase efforts to ensure a higher percentage of energy retrofits for existing homes and buildings.

- *Public Sector Energy Efficiency.* California's Energy Efficiency Financing Program is a revolving loan fund that provides low-interest-rate loans to local governments, schools (K-12), and public institutions including hospitals for the installation of cost-effective energy efficiency and clean energy projects. Moreover, California administers the implementation of Proposition 39, The Clean Energy Jobs Act program for schools (K-12) by providing grant money to local education agencies for energy efficiency upgrades and clean energy projects.

NATURAL RESOURCES

- *Overview.* California will target landscape health through broader investments in natural lands to ensure their ability to withstand climate change, while increasing sequestration and provisioning of ecosystem services such as improved biodiversity, clean water, and air.
- *Land Conservation and Carbon Sequestration.* California's 100 million acres are critical to meeting all of the State's climate goals. The land base includes one of the world's biodiversity hotspots, provides more than 65 percent of the potable water used in State, produces food for millions of people, and sequesters carbon in trees, wetlands, grasslands, rangelands and soils, among other land types. California is quantifying expected carbon sequestration and GHG emissions on all natural and working lands and developing first of their kind carbon models to guide conservation investments, regulations, and state-owned land management actions. These steps will allow California to meet 2030 carbon sequestration goals for farms, rangelands, forests, and wetlands.
- *Forest Health Management.* By increasing forest health management efforts, California's residents will experience cleaner air through reduced severity of wildfires, increased carbon sequestration, and increased biodiversity. California's Forest Health Grant Program will use funds from the greenhouse gas reduction fund to implement projects that proactively restore forest health, reduce greenhouse gases, protect upper watersheds where the State's water supply originates, promote the long-term storage of carbon in forest trees and soils, and minimize the loss of forest carbon from large, intense wildfires.
- *Healthy Soils Program.* California appropriated \$7.5 million from the State's greenhouse gas reduction fund in 2016 to develop and administer the Healthy Soils Program. This program encourages innovative farm and ranch management practices that build adequate soil organic matter, increase carbon sequestration, and reduce overall GHG emissions. These efforts will be complemented by organic waste diversion to produce rich compost for California's healthy soils and support reduced fertilizer use in California's agricultural fields.
- *Urban Greening and Urban Forestry.* California's 2014 to 2015 investments in urban greening nearly exceed the budget set by the U.S. Forest Service for the entire country. In addition to expansive urban forestry investments targeted to disadvantaged communities around the State, the State's new Urban Greening Program makes additional investments in broader multi-benefit projects. Those investments reduce greenhouse gases by sequestering carbon, decreasing energy consumption, and reducing vehicle miles traveled, while also transforming the built environment into places that are more sustainable, enjoyable, and effective in creating healthy and vibrant communities.

ADAPTATION AND RESILIENCE

- *Overview.* The State's adaptation activities focus on integrating climate change into the State's planning and investment, coordinating with and supporting mandates and actions at the local and regional levels, and investing in research, guidance, and tool development to support action on the ground.
- *Safeguarding California Plan.* This Plan is a roadmap showing how California is taking action to respond to the ongoing and projected effects of climate change by laying out what needs to be done and how the state government will achieve those goals. The hundreds of actions and recommendations listed in the "Safeguarding California Plan" were developed through the scientific and policy expertise of staff from over 30 state agencies. The "Safeguarding California Plan" provides overarching strategies and recommendations, and outlines ongoing

actions as well as cost-effective and achievable next steps to make California more resilient to climate change across 11 different policy areas. This roadmap also provides a transparent and accountable tool for the public to evaluate the State's progress.

- *Integrated Climate Adaptation and Resiliency Program (ICARP)*. ICARP is designed to develop a cohesive and coordinated response to the impacts of climate change by coordinating climate activities at the state, regional, and local levels. ICARP consists of two components. The first component is the State Adaptation Clearinghouse, a centralized source of information and resources to assist decision makers at the state, regional, and local levels when planning for and implementing climate adaptation. The second component is the Technical Advisory Council, which brings together local government, practitioners, scientists, and community leaders to help coordinate implementation activities that better prepare California for the impacts of a changing climate.
- *Cal-Adapt*. Cal-Adapt is a web-based climate adaptation tool designed to provide access to the wealth of data and information that has been, and continues to be, produced by State of California's scientific and research community. The data available offers a view of how climate change might affect California at the local level, and represents the best available climate projections downscaled to 6-kilometer by 6-kilometer grids for local policy-makers and the public to use in planning and decision-making. Cal-Adapt users can work with visualization tools, download data, and participate in community sharing to contribute knowledge.
- *Fourth California Climate Change Assessment*. California has invested over \$10 million in a portfolio of 32 research projects that will consolidate current science on expected climate change impacts for California and inform policies and programs to support adaptation and resilience. The "Fourth California Climate Change Assessment" is tailored to inform state agency efforts to address climate impacts, providing critical resources like a decision-support tools for extreme heat events and a new advanced hydrological snowpack forecasting for hydropower management. In addition, regional author teams are synthesizing the results across over 20 external collaborations and developing nine regional summary reports to support action at the regional level for the entire State. The Fourth Assessment will be completed in 2018.
- *Climate Change Indicators*. The State released an "Indicators of Climate Change in California" report in 2013, presenting 36 indicators tracking trends in atmospheric gases that influence changes in the State's climate. California is one of the first states in the nation to compile its own set of indicators characterizing the multiple facets of climate change. While most reports on climate change present future scenarios or projections, the report provides a retrospective account of impacts from climate change that have already occurred.
- *Sea-level Rise*. The "State of California Sea-Level Rise Guidance Document," initially adopted in 2010 and updated in 2013, provides guidance to state agencies for incorporating sea-level rise projections into planning, permitting, investment, and other decisions. California is updating this statewide guidance to reflect recent advances in ice loss science and projections of sea-level rise. These advances are outlined in "Rising Seas in California: An Update on Sea-Level Rise Science," which serves as the scientific foundation to the guidance. The updated guidance will focus on the needs of state agencies and local governments. It will help cities and counties as they comply with a new law that requires them to incorporate climate change into their planning efforts.
- *Water*. The "California Water Action Plan" lays out an all-of-the-above strategy for building resiliency in our State's water supply through increased conservation and efficiency, infrastructure investment, water recycling, new above and below ground storage, and improved water system dependent ecosystems. The State has supported general obligation bond funding to implement different components of the plan, which has leveraged significant local funding as well. All of these strategies aim to strengthen and diversify the water resources available to the State in order to be able to better withstand future droughts.