

2030 Carbon Target and Adaptation

CALIFORNIA IS TAKING EARLY, DECISIVE ACTION TO REDUCE CARBON OUTPUT. THE STATE IS ALREADY EXPERIENCING UNPREDICTABLE SHIFTS IN WEATHER PATTERNS, PROLONGED FIRE SEASONS AND MEASURABLE SEA LEVEL RISE ASSOCIATED WITH CLIMATE CHANGE. BECAUSE OF THIS, MEASURES TO ADAPT TO THESE CHANGES MUST BE TAKEN. WITH THIS EXECUTIVE ORDER, WE ARE ACCELERATING CUTS TO CARBON OUTPUT THROUGH 2030 TO REDUCE CONTINUED TEMPERATURE RISE, AND SHIFTING INFRASTRUCTURE PRIORITIES TO PROTECT AGAINST CLIMATE-CHANGE RELATED IMPACTS IN THE FUTURE.

2030 Target

What is the purpose of a 2030 greenhouse gas reduction target?

Immediate and committed global action is necessary to slow the damaging impacts of climate change. Reducing greenhouse gas emissions by 40 percent below 1990 levels in 2030 ensures that California will continue its efforts to reduce carbon pollution and set the economy on a trajectory to help stabilize global temperatures. Setting a target sends a message around the world to states and regions that California is a potential partner and role model.

Reducing greenhouse gas emissions by 40 percent in 2030 is also important to help us achieve federal health-based air quality standards, and continue to drive investments in clean technology and clean energy in California, where growth in those sectors is outpacing the rest of the country.

But don't we already have a 2050 target? Why a 2030 target in addition?

Reducing greenhouse gas emissions by 40 percent below 1990 levels in 2030 and by 80 percent below 1990 levels by 2050 aligns with scientifically established levels needed in the U.S. to limit global warming below 2°C. The latest science shows that the path taken to achieve necessary science-based targets in 2050 is just as important as achieving the 2050 target itself and that we need a series of coordinated programs to capture cost-effective emission reductions opportunities wherever possible, not only in 2050, but at every point along the way. Setting clear targets beyond 2020 also provides market certainty to foster investment and growth in a wide array of industries throughout the State.

How will the 2030 target affect investment in clean technology, innovation and job development?

California has already made great progress in driving the development of clean technologies thanks to programs developed under AB 32 and other important Legislation; the 2030 target will ensure that success continues beyond 2020. Fighting climate change is a long-term commitment, and to continue -- and accelerate -- the full range of initiatives and solutions we need to send strong policy signals to companies, financiers, and entrepreneurs that continued investment and innovation to decarbonize California's economy, support clean technology and create new jobs will be rewarded over the long term.

Is California 'going it alone' in this effort?

Not at all. As part of their Intended Nationally Determined Contributions (INDCs) to the Conference of Parties meeting of the United Nations Framework Convention on Climate Change in Paris in December of 2015, countries are making pledges to reduce greenhouse gas emissions. The U.S.

has pledged to reduce its emissions by 26-28 percent below 2005 levels by 2025, and the Obama Administration has proposed rules to significantly cut greenhouse gas emissions from the power sector through 2030. The European Union and Norway have pledged to reduce emissions by 40 percent below 1990 levels by 2030, Switzerland has pledged a 50 percent reduction below 1990 levels by 2030, and Mexico has pledged to reduce emissions by 25 percent below 2013 levels by 2030, and potentially as much as 40 percent as part of a broad, global agreement. Additionally, the United Kingdom has legislation requiring a 50 percent reduction below 1990 levels by 2027, and Germany has committed to reduce emissions by 40 percent below 1990 levels by 2020, and by 55 percent below 1990 levels by 2030

In addition, California has linked its cap-and-trade program with the province of Quebec, and is discussing linkage with Ontario. Through the Pacific Coast Collaborative (CA, OR, WA, BC) and other initiatives, California is actively working to develop additional regional and coordinated approaches to greenhouse gas reductions.

How do the Governor's existing 2030 goals align with the overall 40 percent 2030 greenhouse gas reduction target?

In his Inaugural Address in January 2015, Governor Brown identified five key goals for reducing greenhouse gas emissions in California through 2030, and showing the world the way to stabilizing global warming below 2°C:

- Increase renewable electricity to 50 percent,
- Double energy efficiency savings achieved in existing buildings and make heating fuels cleaner,
- Reduce petroleum use in cars and trucks by up to 50 percent,
- Reduce emissions of short-lived climate pollutants, and
- Manage farms, rangelands, forests and wetlands to increasingly store carbon.

These goals are all well-aligned with an overall 40 percent greenhouse gas reduction target. As part of an integrated strategy to help manage the electricity grid efficiently, the energy efficiency and renewable energy goals can help reduce energy costs and greenhouse gas emissions in the electricity, residential and commercial sectors to levels that are in-line with an overall 40 percent target. Similarly, cutting petroleum use in half by 2030 aligns with the 40 percent target and is necessary to meet required federal health-based air quality standards. Emission reductions from all sources – including non-CO₂ gases and from natural and working lands – are necessary to stabilize climate change.

Can California achieve a 40 percent reduction?

Yes. We already have a 'running start' with successful policies in place that are delivering significant reductions as a result of cleaner and more fuel-efficient cars, zero emission vehicles, cleaner low-carbon fuels, more renewable energy and ongoing efforts to improve the energy efficiency of our homes and businesses.

We will need to continue those efforts, and accelerate them including a focus on zero- and near-zero technologies for moving freight, continued investment in renewables including solar roofs and distributed generation, greater use of low-carbon fuels including electricity and hydrogen, stronger efforts to reduce emissions of short-lived climate pollutants (methane, black carbon and fluorinated gases), and further efforts to create livable, walkable communities and expansion of mass transit and other alternatives to traveling by car. Continuing the cap-and-trade program and ensuring that natural lands become carbon sinks provide additional emissions reductions and flexibility in meeting the target.

Several analyses – including those by E3,¹ Lawrence Berkeley National Laboratory,² the National Renewable Energy Laboratory,³ UC Berkeley,⁴ and Energy Innovation,⁵ among others – demonstrate a range of feasible technologies and policy pathways to meet the target.

1 https://ethree.com/public_projects/energy_principals_study.php
2 <http://eetd.lbl.gov/publications/modeling-california-policy-impacts-on>
3 <http://www.lowcarbongrid2030.org/>
4 Publication forthcoming
5 <http://energyinnovation.org/wp-content/uploads/2015/03/>

What are the economic impacts of a 40 percent target?

The costs associated with any future scenario are uncertain, and depend on a wide array of assumptions related to oil and natural gas prices, as well as technology costs for conventional and clean technologies. In recent years, there has been tremendous innovation that has significantly reduced the cost of clean technologies, and today, tremendous opportunity exists to improve efficiency and cut costs – solar and wind power are cost-competitive in many places, leases for electric vehicles are among the least expensive new car options, and some fueling stations sell renewable diesel at a lower price than conventional diesel. Still, additional innovation, economies of scale, and state and federal policies are needed to accelerate market growth for critical technologies and further bring down costs so that they are competitive on a broad scale.

Analysis by E3 of a 2030 target included an accounting of technology and energy costs, assuming somewhat conservatively that the pace of clean technology innovation and cost reductions slows from recent years. One scenario results in greenhouse gas emission reductions of 38 percent below 1990 levels at an average cost of \$39 per household per month. This analysis does not include savings in health costs or other macroeconomic impacts associated with achieving these reductions, which would be necessary to estimate whether such a scenario would ultimately have a positive or negative impact on economic growth and job creation. Different analyses that consider the macroeconomic impacts of strong action to address climate change have shown potentially positive or negative impacts on economic growth, although all tend to be very small in the context of the entire California economy.

Will meeting this target affect the reliability of the electricity grid?

No. California has effectively integrated a rapidly increasing portion of renewable energy on its grid already, which has reached 40 percent of total generation during some hours, and can easily accommodate 50 percent or more renewables by 2030. Regardless of the fraction of generation coming from renewable resources, effective, integrated grid planning is needed to maintain reliability. The State's energy agencies constantly coordinate to ensure that efforts to increase renewable electricity and reduce greenhouse gas emissions align with those aimed at maintaining and improving grid reliability.

What are the next steps for the 2030 target?

The Executive Order directs state agencies to take measures consistent with their existing authority to reduce greenhouse gas emissions. In addition, the California Air Resources Board will initiate a public process in the summer of 2015 and work closely with other state agencies to update the State's climate change Scoping Plan.

The updated Scoping Plan will provide a framework for achieving the 2030 target and will be completed and adopted by the Air Resources Board in 2016. As part of that process, public workshops will be held over the next several months to discuss new and existing approaches for reducing emissions on a sector-by-sector basis.

Concurrent planning efforts related to energy efficiency in existing buildings (AB 758), short-lived climate pollutants, sustainable freight, Greenhouse Gas Reduction Fund Investments, forest health, and others will be coordinated with, and feed into, the updated Scoping Plan.

This executive action sets the stage for the important work being done on climate change by the Legislature.

Adaptation

Why is adaptation a key part of our climate change program?

California is already experiencing adverse impacts from climate change. These include drought and wildfires; sea level rise that is accelerating coastal erosion; higher levels of harmful air pollution; increased public health risks caused by longer periods of high heat; and loss of biodiversity.

These risks are real; however, we are not out of reach of adapting to and protecting against them. Adaptation efforts can also bring many benefits with long-term planning and investments. Stronger local infrastructure for water and power that does not rely on distant and potentially

fragile connections lowers costs and increases reliability. Measures to reduce air pollution benefit us all. Better defenses against wildfires saves lives and homes.

California is currently in the midst of the worst drought in recorded history. Although the link between global warming and the drought has not been definitely established, peer-reviewed studies suggest that the two are linked, and there is broad consensus that climate change will make severe droughts like this one more frequent in California and other states. This is a glimpse of a new “normal” – a dwindling snowpack with the potential for more warm rain. In the short term, farmers and cities will increasingly turn to reservoirs and groundwater, but adaptation planning and projects are needed for long-term stability. Lack of water has also led to more frequent and intense wildfires, including the Rim fire, which scorched the largest area on record in the Sierra Nevadas.

The majority of Californians live along the coast, exposing them to risk from sea-level rise, storms, and saltwater intrusion. Already, the sea level in California has risen approximately 7 inches (18 centimeters) from 1900 to 2005, reports the National Climate Assessment. The average temperature in California in 2014 was the highest ever recorded; average temperatures were 4 degrees higher than the average temperatures in the 20th century.

Adaptation measures include using scarce water more efficiently, adapting building codes to future climate conditions and extreme weather events, building flood defenses and raising the levels of levees, developing drought-tolerant crops, choosing tree species and forestry practices less vulnerable to storms and fires, and setting aside land corridors to help species migrate.

What guides California’s adaptation activities?

The Safeguarding California Plan, published in July 2014, is a comprehensive strategy to protect the state’s environment, economy, and people from ongoing and inevitable climate threats. It provides guidance in nine broad areas where California will suffer from climate impacts: agriculture, biodiversity and habitat, emergency management, energy, forestry, ocean and coastal ecosystems and resources, public health, and transportation.

By identifying climate risks and vulnerabilities as well as the sector-specific actions needed to address them, the Plan comprehensively sets the direction for California’s adaptation initiatives.

The Governor’s Order specifically directs planners to present detailed steps for responsible agencies to take in each of these nine areas. These documents can be used by local and state-level policymakers to guide investments in key areas to best protect and improve human health and safety.

What actions is the state currently taking on climate change adaptation?

State agencies implement the Safeguarding California Plan through a range of initiatives, which can be broadly categorized into tools and practitioner guides, sector-specific detailed action plans, and investments.

Tools and practitioner guides help local and regional governments, businesses, and the general public to understand and plan for climate impacts. Cal-Adapt is a web-based adaptation visualization and planning tool that incorporates state-of-the-art climate modeling that shows information about climate threats like extreme heat and permanent warming, sea-level rise, loss of snowpack, and wildfire risk at a local level.

The Adaptation Planning Guide consists of four sets of step-by-step instructions for local and regional planners to prepare for climate threats. Threat-specific guidance like the State of California Sea-Level Rise Document provides local decision-makers the information they need to best prepare for climate-related coastal hazards.

The California Water Action Plan and the State Hazard Mitigation Plan are currently being funded and implemented. Specific threats are being addressed through programs like Preparing California for Extreme Heat, the Bay Delta Conservation Plan and the Desert Renewable Energy Conservation Plan.

The State is investing in climate adaptation through grants and other expenditures, like the Greenhouse Gas Reduction Fund. These programs mitigate climate risks as well as greenhouse gas emissions through activities like urban forestry, wetlands restoration, and water efficiency. Infrastructure funded by the state is another way for California to create a built environment more

resilient to climate impacts as well, including grants from programs funded by Proposition 1, California's historic water bond.

How does this Executive Order further the State's adaptation efforts?

The Executive Order requires that the state's adaptation strategy, Safeguarding California, is updated every 3 years; identifies vulnerabilities to climate change by sector or regions; outlines primary risks to residents, property, communities and natural systems; and establishes a process for agency coordination.

The Order also establishes a process for tracking implementation of adaptation activities, and requires that state agencies incorporate climate change into their planning and investment decisions using a full life-cycle cost accounting to evaluate and compare infrastructure investments and alternatives. The Order also requires that the 5-Year Infrastructure Plan incorporates current and future climate change impacts in decisions to construct new infrastructure projects and rehabilitate existing ones. The Safeguarding Plan provides the policy base for local and state policymakers to invest in adaptation projects. Infrastructure investments will provide multiple benefits to taxpayers, including heading off drought impacts with water recycling and storage projects and lower insurance rates with improved flood infrastructure.

How will this Order help with the State's drought response efforts?

With California facing one of the most severe droughts on record, Governor Brown has taken action to prepare for the impacts of extreme weather. Near-term actions include mandatory water rationing orders for cities and significant curtailments of water deliveries to farms.

Long-term actions to help prepare California for future droughts present substantial opportunities to improve regional self-reliance for water supplies and enhance and improve flood control projects. Emergency legislation accelerated grant funding for water recycling, storm water capture and managements, groundwater clean-up, and levee and flood control system improvements.

Regional self-reliance projects protect our communities from the impacts of drought and shifting and unpredictable weather patterns caused by climate change. Detailed implementation plans for each sector of the Safeguarding Plan as required by this Executive Order will ensure overall policy direction and provide the steps needed to complete these important projects.

The current drought serves as a tangible reminder that our entire state is vulnerable to shifting weather patterns. These projects will help people and the economy adapt to unpredictable impacts.

In addition, moving water around the state requires vast amounts of energy. Continued efforts at water conservation at all levels will reduce the greenhouse gases associated with pumping, moving, heating and using water. Thriving forests that serve as carbon sinks will also help to protect and enhance many of the State's most critical watersheds.

How does the Order relate to adaptation actions carried out at the local and regional level?

The Executive Order makes climate adaptation a top priority in infrastructure planning and identifies sector specific vulnerabilities throughout California. It also establishes accountability for assessing and tracking implementation of adaptation efforts. Local government and regional collaboratives, such as the Alliance of Regional Collaboratives for Climate Adaptation (ARCCA), utilize and benefit from state developed tools, research, guidelines, and planning documents as they assemble local and regional climate adaptation plans and projects.