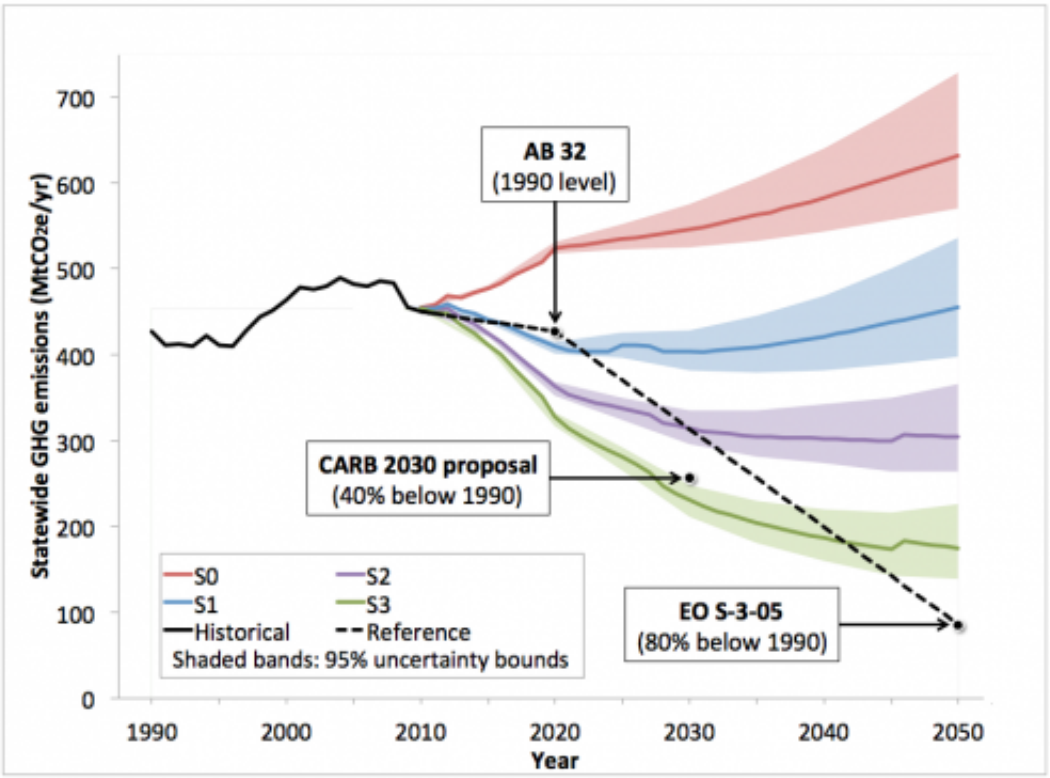
California's policies can significantly cut greenhouse gas emissions through 2030

January 22 2015, by Julie Chao



The CALGAPS model shows greenhouse gas emissions through 2050 under four different scenarios. Credit: Lawrence Berkeley National Laboratory

A new model of the impact of California's existing and proposed policies on its greenhouse gas (GHG) reduction goals suggests that the state is on track to meet 2020 goals, and could achieve greater emission reductions by 2030, but the state will need to do more to reach its 2050

climate goals.

"The big news here is that not only will California meet its 2020 reduction goals under AB 32, but it could achieve reductions of at least 40 percent below that level in the 2030 time frame," said Jeffery Greenblatt, author of the study and a scientist at the Department of Energy's Lawrence Berkeley National Laboratory (Berkeley Lab). The paper, "Modeling California policy impact on greenhouse gas emissions," has been published in *Energy Policy*.

Greenblatt's research, which was funded in part by the California Air Resources Board (CARB), is the first attempt to comprehensively model all relevant policies in order to assess their combined effect on reducing California GHG emissions, especially through 2030. The research is intended to inform ongoing policy discussions in California by developing scenarios of GHG reductions that result from the aggregation of various policies. Scenario analysis can suggest which combinations of actual and proposed policies result in the largest emission reduction. The study also quantifies the reduction impact of individual policies.

The state's AB 32 legislation, the California Global Warming Solutions Act of 2006, requires a reduction in state GHG emissions by 2020 to its 1990 level of 431 million metric tons carbon dioxide equivalent per year (MtCO2e/year). Additionally, California Executive Order S-3-05 sets a target of reducing state GHG emissions to 80 percent below this level by 2050. Other state legislation governs specific areas such as transportation, electricity, and fuels.

Greenblatt's new model, dubbed CALGAPS (California LBNL GHG Analysis of Policies Spreadsheet), indicates that GHG emissions through 2020 could range from 317 to 415 MtCO2e/year, all still below the AB 32 target, "indicating that existing state policies will likely allow California to meet its target," he said.

By 2030, emissions could range from 211 to 428 MtCO2e/year. "Even if all modeled policies are not implemented, reductions could be sufficient to reduce emissions 40 percent below the 1990 level," Greenblatt said.

Although CALGAPS did not generally simulate policies that might be put in place after 2030, it did account for emissions through 2050, to understand the lasting impact of existing and potential policies that might be implemented over the next several years.

Accordingly, all of the scenarios Greenblatt modeled fall well short of the state's 80 percent reduction goal by 2050. However, various combinations of policies could allow California's cumulative emissions to remain very low through 2050, consistent with U.S. targets promulgated by the U.N.'s Intergovernmental Panel on Climate Change (IPCC) to keep global warming below 2 degrees Celsius. While additional analysis and policymaking will certainly be needed to meet 2050 goals, Greenblatt's study highlights the importance and potential of near-term action to work towards global climate stabilization targets.

Forty-nine policies in the CALGAPS model

CALGAPS is an energy model that simulates California's GHG and criteria pollutant emissions from 2010 to 2050. It uses historical and projected future trends in energy consumption, GHG fuel intensities, GHG emissions apart from energy, and policy-based assumptions to calculate how much GHG the state emits under different combinations of policies. The model incorporates 49 individual policies.

"The model divides policies into three types," Greenblatt said. "Committed policies (S1) are those that have the force of law and are being implemented, such as AB 1493, which mandates efficiency improvements in light-duty vehicles, building energy efficiency standards like Title 24, and the renewable portfolio standard (RPS),

which mandates 33 percent renewable electricity generation use by 2020."

Federal policies such as the Clean Water Act also have a direct impact on state GHG emissions.

Uncommitted policies (S2), the second type, may lack detailed implementation plans or firm financial support, but have all been proposed, such as new efficient and zero net energy building targets, construction of the high-speed rail system, and initiatives by various agencies to, for example, increase biofuels use and continue progress in improving vehicle efficiency.

The third group, potential policies and technologies (S3), include more speculative changes, including several that extend policy initiatives in the committed and uncommitted groups. These policies include more aggressive vehicle efficiency improvements, building electrification, higher RPS targets, and expanded carbon sequestration activities, among others.

"One of the most important results of this study is that the GHG impact of each individual policy is quantified for the first time," Greenblatt said. "This allows policymakers to compare policies in different sectors and evaluate trade-offs."

Among the most impactful policies, the study finds—those with reductions in excess of 20 MtCO2e each in some years—are the AB 1493 vehicle efficiency standards, the 33 percent RPS target, building efficiency targets, phasing out imported coal electricity and phasing out hydrofluorocarbon gases.

Another important insight was the idea of looking at cumulative emissions. As the paper states: "Due to early emissions reductions, S3

achieves lower cumulative emissions in 2050 than a pathway that linearly reduces emissions between 2020 and 2050 policy targets."

The less ambitious S2 pathway achieves lower cumulative emissions through 2040. Greenblatt concluded: "Additional policies beyond those in S3 would be needed to continue reduction beyond 2050, but focusing on cumulative reductions may offer a more flexible policy framework."

Provided by Lawrence Berkeley National Laboratory